सत्यमेव जयते

INDIAN AGRICULTURAL
RESEARCH INSTITUTE, NEW DELHI

I.A.R I.6.
GIP NLK—H 3 I.A.R.I.—10-5-55—15,000

Bulletin of the Agricultural Chemical Society of Japan.

Vol. 17.

(Nos. 196 - 207)

1941

47814

The Agricultural Chemical Society of Japan.
c/o Faculty of Agriculture, Tokyo Imperial University.

Contents

I. Transactions.

PAGE

T. YOSHIDA, T. FUKUURA, T. TANAKA und K. YAMAFUJI: Einige Versuche über die Bestimmung der reduzierenden Zucker im Zuckerrohr und im Handelszucker. 39

T. YOSHIDA, B. WO, T. FUKUURA und K. YAMAFUJI: Untersuchungen über den Kohlenhydratstoffwechsel im Zuckerrohr mit Hilfe der Pikrinsäuremethode. 51

K. HONDA, C. WO, N. MIYAJI und K. YAMAFUJI: Weiteres über die Bestandteile des Zuckerrohrs. 71

T. TATSUNO, F. NISHIO, S. AOKI und K. YAMAFUJI: Über das Pentosan des Zuckerrohrs. 81

II. Abstracts from Transactions published in Japanese.

Page

On Some Properties of Aldol and the Construction of p-Aldol. (M. HORI). ... 1

Study of the Insecticidal Principle in the Smoke Produced by Combusting Incect Powder. (Part III) (Makoto NAGASE). ... 2

Sterilizing Action of Acids and Phenols 15th Peport. Summaries and Conclusion of the Sterilizing Action of Phenols and Aromatic Acids. (Sogo TETSUMOTO). ... 2

Studies on the Acid Fermentation by Rhizopus Species. (Part I.) (K. SAKAGUCHI, T. ASAI, and H. MUNEKATA). ... 4

On the Biochemical Properties of Diphtheria Toxin. (Tetutaro TADOKORO and Tuneyuki SAITO). ... 5

Studies on the Determination of Vitamin B_1 in Various Food Materials by the Thiochrome Method. (Hisasi ARIYAMA, Ryusaku HOSINO, and Yosisaburo NAKAZAWA. ... 5

Chemical Researches on the Pulp Woods of Siam. (Masuzo SHIKATA, Yoshitugu KIMURA, Kozo NAKAMURA, and Shinzo HACHINOE). ... 6

Über die Beseitigung der hemmenden Wirkung des Furfurols durch Natriumsulfit. (Besonders in Bezug auf ein Verfahren, die Maisch durch Säureverzuckerung zu verbessern.) (Shinichiro BABA). ... 9

An Iodometric Method for the Determination of the Sum of Aldol and p-Aldol Existing together with Acetaldehyde. (M. HORI). ... 10

On the Regenerated Brown Forest Soil in North-east Manchuria. (R. KAWASHIMA and M. NAGATA). ... 10

On the Occurrence of Threonine in Meat-proteins of Some Marine Animals. (Mrs. Yasu HATAKOSHI). ... 10

Chemical Studies on Clay-soil under Water. (Part II.) On the Chemical Constituents of Shallow Water Deposit Along the Coast of Chosen. (Masayoshi ISHIBASHI). ... 11

Untersuchungen über die Beziehungen von Bataten zur Alkoholproduktion. II. (Y. TAKEDA, K. SUEMATU und M. UTIKOSI). ... 11

Dietary Studies on the Increase of Utilizing Value of Northern Farm Animals. (II). Hair Growth and Feed. (Rabbit). (E. TAKAHASHI and K. SHIRAHAMA). ... 11

On the Stimulant for Cane Sugar Formation in Plants. (VIII.) (Tetutaro TADOKORO and Masao NISIDA). ... 11

Studies on the Nutritional Chemistry of the Cuttle-fish. III. The Mineral Composition of Meat and Liver of Cuttlefish and Liver Amylase. (Mrs. Yasu HATAKOSHI). ... 11

Functional Studies on Soils. (XI~XII). (MISU-Hideo). ... 12

Über den Brechungsexponenten der Proteinlösung (S. SHINANO). ... 12

On the Changes in the Lacto-flavin Contents of Silkworms (Bombyx mori L.) during Metamorphosis. (B. MARUO and H. KOIKE). ... 13

Studies on the Propionic Acid Fermentation. Part I. (Kinichirô SAKAGUCHI, Mamoru IWASAKI, and Syûzô YAMADA). ... 13

Über eine neue Quantitative Analyse des Eisens. (Shinichiro BABA). ... 16

On the Brown Forest Soil in the Upper Region of the Non River, North Manchuria. (R. KAWASHIMA and M. NAGATA). ... 19

On the Preparation and Some Properties of Yeast Amylase. (Reitaro MURAKAMA). ... 20

Functional Studies on Soils. (XIII~XIV). (MISU-Hideo). ... 20

Ein synthetischer Versuch von β-Indol-essigsäu e (Indol-3-essigsäure). (Sankiti TAKEI und Takenosuke TAKANO). ... 20

On the Fermentation Degumming of Waste Silk. Part VI. The Action of Degummase and Thermodegummase upon Protein Substances. (Hideo KATAGIRI and Toshio NAKAHARA). ... 21

Researches on " Maoran " as a Raw Material for Paper Pulp and Raw Pulp. (Motô YAMANE and Tomizô MATUI). ... 21

On the Fixation of Silk-Sericin with Formaldehyde (Tosio NAKAHAMA and Ikuzo SAKAGUCHI). ... 22

Biochemical Studies on Diphtheria Toxin. (Tetutaro TADOKORO, Tuneyuki SAITO, and Naomoto TAKASUGI). ... 22

On the Hydrolysis of Fats and Fatty Acid Esters. (9). (Toyoki ONO). ... 22

Some Experiments on Fresh Tobacco Leaves. (K. OIKE). 24
Über die Bestandteile der japanischen Mistel. I. Isolierung von Arginin. II. Untersuchungen über Harze. (Yataro OBATA). 25
Functional Studies on Soils. (XV∼XVI). (MISU-Hideo). 25
Studies on the Chemical Sterilization and Preservation on Fishes and Shellfishes. (Sogo TETSUMOTO). 25
On Amino Acids in Saké. (Yasuji TADA and Toraji TUKAHARA). 26
The Effect of the Amount of Food Consumed in Animal Experimentation. (Isa NAKAMURA). 26
Biochemical Studies on Glutathione. Report XVI. (The Glutathione Content in Organ Tissues in Starvation.) (Masayoshi OGAWA). 26
The Utilization of the By-Products of Soybeans. (Part VI.) On the Hydrolysis of Stachyose. (Yosaburo IWASA). 27
Über den Mechanismus der Enzymwirkungen. (Yukihiko NAKAMURA und Kakomu SATOW). 27
Influence of Monochromatic Lights on the Action of Enzymes. (Report XXXIV∼XXXVI). (Reitaro MURAKAMI). 28
On the Chemical Studies of the Bagase-pulp. (Tetutaro TADOKORO and Keizo ITO) 28
Studies on the Hydrolysis of Protein at High Temperature and Pressure (I). (Kenzo NAKAJIMA and Masami IKEDA). 29
The Fat Metabolism of the Mold Fungi. (I). (The Fat formation by *Penicillium javanicum* cultured on the sugar cane juice.) (Shinichi SUZUKI). 30
Studies on the Chemical Constituents of "Inekoji." Part VIII. On the Margaric Acid Ester of Arabit (I). (Teijiro YABUTA, Yusuke SUMIKI, and Kinjiro TAMARI). 31
Abbau von Aminosäuren durch Asp. Oryzae. IV Mitteilung. (Teijiro UYEMURA). 31
On the Preparation of Methylethylketone and Isobutylaldehyde from 2, 3-Butyleneglycol (Shinzaburo FURUHASHI and Kisetsu ŌHARA). 31
Studies on the Root Forming Substances of Cuttings. (Kinjiro TAMARI). 31
On the Fixation of Sericin of Raw Silk. (Part VI). On Method of Denoting the Degrees of Fixation of Sericin. (Masami OKU). 32
Studies on the Chemical Sterilization and Preservation on Fishes and Shellfishs. II∼III. (Sogo TETSUMOTO) 32
On the Oxidizing Enzymes in Tea Leaf. I. (Hideiti TORII). 32
On the Fixation of Silk-Sericin with Formaldehyde. Part 2. The Adsorption of Formaldehyde on Various Kinds of Sericin. (Toshio NAKAHAMA and Ikuzo SAKAGUCHI). 33
Functional Studies on Soils. (XVII∼XIX). (Hideo MISU). 33
Functional Studies on Soils. (XX∼XXII). (Hideo MISU). 33
On the Denaturation of Sericin. (Part 4.) Some relation of denaturation of $\alpha_{3.3}$-sericin with $\alpha_{4.4}$-sericin. (Zirô HIROSE). 33
The Colloidal Clay in Solonchak and Solonetz Soils in Manchuria. (KAWASHIMA and M. NAGATA). 36
Studies on the Value of Chemicals as Manure for *Juncus effusus* L. var. *decipiens* BUCH. III. On the Value of Some Compound Fertilizers. (H. SUTOH). 36
On the Chemical Studies of the Bagase-pulp. (2∼3). (Tetutaro TADOKORA and Keizo ITO). 38
Separation and Identification of Fatty Acids. Part 3. A New Method of the Preparation of Pure Oleic Acid and Elaidic Acid by Means of the Hydroxamic Acid Method. (Y. INOUYE and H. YUKAWA). 44
Zinc Dust Distillation of some Benzene Compounds. (Zirô NIKUNI, Hiroshi HAYASHI, and Susumu TSUJI). 45
Über die quantitative Bestimmung der Pyrethrine. IX. Mitteilung. Veränderung von Pyrethrinen durch Licht und Wärme. (Sankiti TAKEI, Kiyosi WAKAZONO und Keizo HIRAOKA). 46
Ascorbic Acid Content of Citrous Fruits. (Yasuo IWASAKI and Toshio KOMATSU). 47
Researches on Mechanical Wood Pulp. (Part VII). The Practical Application of the Fiber Classifier to Pulp-Studies. (K. KIMURA). 47
Simpler Estimation of Copper Number of Pulp. (S. HONDA and K. HAGIWARA). 47
Dietary Studies on the Increase of Utilizing Value of Northern Farm Animals. (III). Experiment on Sheep with Hydrolyzed Products of Human Hair. (Part 1). (E. TAKAHASHI, K SHIRAHAMA, and M.

YOSHIDA). 47

Studies on Methionine and its Derivatives. (I). On the Detection of Methionine. (Yoshio TSUCHIYA). 48

On the Chemical Studies of Bagasse Pulp. (4). (Tetutaro TADOKORO, Masao NISHIDA, and Keizo ITO). 49

Researches on Bamboo in Taiwan as a Raw Material for Pulp. Part V. (On the Digestion of "Keitiku" by the Magnesium Sulfite Method). (Minoru TUTIYA, Setuo FUKUHARA, and Yoshiteru KATO). 49

On the Flavonol Glucoside of Euphorbia thymifolia L. (Makoto NAGASE) 50

Functional Studies on Soils. (XXIII~XXVI). (Hideo MISU). 50

Separation and Identification of Fatty Acids. (Y. INOUYE, H. YUKAWA, and H. KATSUMATA). 59

Study of the Insecticidal Principle in the Smoke Produced by Combusting Insect Powder. (Part IV). (Makoto NAGASE). 60

Studies on Methionine and its Derivatives. (II). On the Separations of Methionine from Crude Leucine. (Yoshitaro TAKAYAMA and Yoshio TSUCHIYA). 61

Untersuchungen über die chemischen Bestandteile der Früchte von *Rhus semialata* Murr., insbesonders die salzig Schmeckenden. (H. UOTA und K. NISHIDA). 62

Functional Studies on Soils. (XXVII~XXVIII). (Hideo MISU). 65

Biochemical Studies of "Bakanae" Fungus. Part 8. Effect of Gibberellin on Soybean Malt. (T. YABUTA, Y. SUMIKI, N. MURAYAMA, and K. SUZUKI). 65

The Effect of Cold Storage upon Vitamin A Content of Whale Livers. (T. MORI and S. ASAKAWA). 66

On the Chemical Studies of the Bagasse Pulp. (5). (Tetutaro TADOKORO, Masao NISHIDA, and Keizo ITO). 66

On the Oxidizing Enzymes in Tea Leaf. II. (Hideiti TORII). 66

Studies on the Tannin of *Acacia confusa* Merrill. (II). (Minoru ISHII). 66

Studies on Red Yeast. 1. *Sporobolomyces* nov. sp. (Report 1) Morphology and Physiology of the yeast *Sporobolomyces* nov. sp. (Izue YAMASAKI and Seizi MORISHTA). 67

Studies on the "P'u-hwang" Seed Oil. (Yuiti SHINOZAKI and Sizuo TAKUMI). 67

On the Chemical Mechanisms of Enzymatic Hydrolysis of Oils and Fats. Part 1. Splitting of Fatty Acid Residues from Natural Oils by Ricinus Lipase Action. (Y. INOUYE and G. SHINTANI). 68

Glutathione Content of Liver. (Lubus dexter, Lubus sinister, Lubus anterior, Lubus posterior, Lubus papiliformis, Lubus caudatus). (Masayoshi OGAWA and Yutaka SETO). 69

On the Metabolism of Organic Acids by Bacteria. III. (S. TADA). 70

Studies on Bios. Part III. Synthesis of Na-*dl*-Pantothenate. (Nobusada ŌKOTI and Tomozi EGAWA). 70

On Xylitol. (2). On Xylitolanhydride (Xylitan). (T. YABUTA, K. ASO, S. KIMOTO, and K. MIWA). 76

Studies on the Mucilage from Rhodophyceae. IV. The Chemical Structure of the Sulfuric Acid Group Split of Mucilage from Chondrus ocellatus Holmes. (T. MORI and Y. TUTIYA). 76

Studies on Red Yeast. 1. *Sporobolomyces* nov. sp. (Report 2) Provitamin A Content in the Yeast *Sporobolomyces* nov. sp. (Izue YAMASAKI and Seizi MORISITA). 76

On the Metabolism of Organic Acids by Bacteria. IV. (S. TADA). 77

Die Konstitution eines neuen, aus der Stärke isolierten Disaccharids und die daraus gezogene Betrachtung über den Aufbau des Stärkemoleküls. (Yukihiko NAKAMURA). 77

Functional Studies on Soils. (XXIX~XXXI). (Hideo MISU). 78

Studies on Methionine and its Derivatives. (III). On the Formation of γ-Methylmercapto-propyl-amine and γ-Methylmercapto-propyl-alcohol from Methionine. (Yoshio TSUTIYA). 78

Researches on Bamboo in Taiwan as a Raw Material for Pulp. Part VI. On the Sulphate Pulp of "Keitiku." (Minoru TUTIYA and Yoshiteru KATO). 78

Studies on a Lactogenic Factor in Soy-beans. IV. Chemical studies of the crystals isolated from the lactogenic alcohol extract. V. The effect of the isolated crystals on the lactation in the guinea pigs. (Yosaburo IWASA). 79

Studies on Bios. Part IV. Effect of Pantothenic Acid, Vitamin B_1, B_6, Nicotinic Acid, *p*-Aminobenzoic Acid and Meso-inositol on a few strains of Sacchromyces cerevisiae. (Nobusada ŌKOTI). 79

On the Stimulant for Cane Sugar Formation in Plants. (IX). (Tetutaro TADOKORO, Yoshio MAKINO, and Keizo ITO). 79

On the Biochemical Properties of the Rice Embryo. (Tetutaro TADOKORO, Tuneyuki SAITO, and Jiro HASHIMOTO). 80

On the Purification of Tyrosine. (Yoshio TSUCHIYA). 80

Utilization of Alcoholic Distillation Waste. (Wasaburo MOGI and Takeo NAGATOMO). ... 80

Acid Saccharification of Mulberry Branches and Alcoholic Fermentation of the Saccharified Solution. (T. YABUTA and T. TATUMI). 80

Biochemical Studies of "Bakanae" Fungus. Part 9. Chemical Constituents of the Fungus. I. (T. YABUTA, Y. SUMIKI, T. TAMURA, and N. MURAYAMA). 80

Enzymatic Studies on Cereals. (Part XIII). On the Change of the Amylase Action During the Ripening of Rice. (Gohei YAMAGISI). 85

On Xylitol. (3). Physical Properties of Xylitol. (T. YABUTA, K. ASO, S. KIMOTO, and K. MIWA). 85

Studies on "Tosetu," a Soy-bean Preparation. I. On the Changes of Composition of Tosetu during its Manufacture and Storage. (K. KATAI and B. KITAHARA). ... 86

Ascorbic Acid Content of Dried Peel, Canned Fruit and Juice of Satsuma Orange (Mandarin orange). (Yasuo IWASAKI and Toshio KOMATSU). 86

Studies on Red Yeast. 1. *Sporobolomyces* nov. sp. (Report 3) Carotinoid Pigments in the Red Yeast *Sporobolomyces* nov. sp. (Izue YAMASAKI, Seizi MORISITA, and Motomasa KAKEI). 86

On the Synthesis of Aspartic Acid. (Yoshio TSUTIYA). 87

Functional Studies on Soils. (XXXII~XXXVII). (Hideo MISU). 87

Biochemical Studies of "Bakanae" Fungus. Part 10. The Chemical Constitution of Gibberellin. I. (T. YABUTA, Y. SUMIKI, K. ASO, T. TAMURA, H. IGARASI, and K. TAMARI). 87

Zur Chemie des Muskeleiweisses. II. Mitteilung. Aminosäuregehalt des Kaninchenmuskeleiweisses. (M. KANDATU). 87

Untersuchungen über das sogenannte „Gluconobacter." I. Mitteilung. (Teijirô UYEMURA und Keiji KONDÔ.) 88

Biochemische Untersuchungen über die Bildung von Pflanzenbestandteilen. (Yukihiko NAKAMURA und Tokuji SCHIMOMURA). 88

Separation and Identification of Fatty Acids. Part 6. Preparation of Pure Linoleic and Linolenic Acids by Means of Hydroxamic Acids Method. (Y. INOUYE and H. YUKAWA). 89

On the Chemical Studies of the Bagasse Pulp. (6). (Tetutaro TADAKORO and Masao NISHIDA). 92

Studies on the Components of the Bark of Rhamnus japonica (V). The Position of the Free Hydroxyl-group of α-Sorinin. (Zirô NIKUNI). 92

Über die Bestandteile der japanischen Mistel. III. Mitteilung. Oleanolsäure, zwei Harzalkohole (β-Amyrin u. Lupeol) in den Blättern. (Yataro OBATA). 94

On the Forest Soil Type in North-Eastern Manchuria. (R. KAWASHIMA, S. TANAKA, and G. TOYAMA). 95

Studies on Crystalline Catalase. (I). On the Isolation of Crystalline Catalase from Beef Liver. (Matsunosuke KITAGAWA and Masaharu SIRAKAWA). 95

The Determination of Carbonic Acid. (II). (Yosaburo IWASA and Kunitaro IWAMOTO). ... 95

Studies on Vitamins of Fish Livers. (Part III). Relation Between Vitamin A Content and Characteristics of Liver Oil. (Hideo HIGASHI). 96

On the Fixation of Sericin of Raw Silk. (Part VII). Dechroming Action of Some Chemicals and Chemical Combinations between Sericin and Basic Chromium Complex Salt of Chrome-fixed Cocoon Silk Fibres. (Masami OKU and Sigetosi SAITO). 100

Synthese des Oxyäthlphthalimid. (Y. OBATA). 101

Untersuchungen über das sogenannte "Gluconobacter." II. Mitteilung. (Teijirô UYEMURA und Keiji KONDO). 101

Functional Studies on Soils. (XXXVIII~XXXX). (Hideo MISU). 101

Studies on "Tosetu," a Soy-bean Preparation. II. On the Vitamin B Content of Tosetu. (B. KITAHARA, K. KATAI, and M. HANADA). 101

Studies on the Nutritive Value of Weeds. (3). (G. FUKAI and M. SATAKE). 101

On the Biochemical Properties of Tomato

and Potato Viruses. (Tetutaro TADOKORO, Tuneyuki SAITO, and Naomoto TAKASUGI) ··· 102

On the Absorption Spectrum of Fatty Oils in Ultraviolet Region. (Kozo KAWAKAMI and Hideo MIYAYOSHI). ··· 102

Chemical Researches on the Dyeing of "O-shima-Tsumugi." Part I. On the Dyeing Tannins from *Rhaphiolepsis umbellata*. (Kotaro NISHIDA). ··· 103

Chemical Studies on Shark-Meat. (1). On the Chemical Composition of Shark-Meat. (Kinsuke KONDO, Sakae SHINANO, and Kenkichi YAMAMOTO). ··· 103

On the Denaturation of Proteins in Benzine-Extracted Soy-bean During Storage. (I). (Shigeki MORI). ··· 103

Enzymatic Studies on Cereals. (Part XIV). On the Mechanism of the Decomposition of Starch by the Action of the Amylase of Rice. (Gohei YAMAGISI). ··· 103

Biochemical Studies of "Bakanae" Fungus. Part II. The Chemical Constitution of Gibberellin. II. (T. YABUTA, Y. SUMIKI K. ASO, T. TAMURA, H. IGARASHI, and K. TAMARI). ··· 104

Chemical Studies on Shark-Meat. (II) On the Solubilities of Shark-Meat-Protein. (Kinsuke KONDO and Yoshio YAMAMOTO). ··· 105

Studies on Insulin from Fishes. (Yuzo TOHYAMA, Sogo TETSUMOTO, Saburo FUKUYA, and Shūzō YAMADA). ··· 105

On the Steppe Soil Type in North-Eastern Region of Manchuria. (R. KAWASHIMA). ··· 107

Untersuchungen über das sogenannte "Gluconobacter." III. Mitteilung. (Teijirô UYEMURA und Keiji KONDO). ··· 107

The Chemiacl Components of Cotton-hulls Produced in Manchuria and North-China. (Rishichi TANAKA). ··· 107

Studies on the Relationship between Horse-hair's Lustre and Nutrition. (I). (S. MIYAMOTO, N. ONUMA, K. ARAI, and G. FUKAI). ··· 108

Über die Awamori-Bereitung nach dem modifizierten Amyloverfahren. (S. SIMO und N. KANAYAMA). ··· 108

On the Denaturation of Proteins in Benzine-Extracted Soy-bean During Storage. (II). (Shigeki MORI). ··· 108

Functional Studies on Soils. (XXXXI~XXXXIII). (Hideo MISU). ··· 108

Studies on the Production of Acetone and Buthanol by Fermentation. Part (II). On the Production of Acetone and Buthanol from Jerusalem Artichoke. (Toshinobu ASAI, Riukichi KOJIMA, and Isamu WATANABE). ··· 108

Biochmical Studies of "Bakanae" Fungus. Part III. The Chemical Constitution of Gibberellin. III. (T. YABUTA, Y. SUMIKI, K. ASO, T. TAMURA, H. IGARASI, and K. TAMARI). ··· 109

Study of the Insecticidal Principle in the Smoke Produced by Combusting Insect Powder. (Part V). (Makoto NAGASE). ··· 109

Über die Bildung der Oxalsäure aus Methanol oder Ameisensäure durch Asp. niger. var Nr 2. (S. BABA). ··· 109

Biochemical Studies on the Tissues and Organs of the Silk Worm, *Bombyx mori* L. Part 1. On the Catalase Actions of the Fatty Bodies. (Takeo NAKASONE). ··· 110

Biochemical Studies of "Bakanae" Fungus. Part 13. Action of Gibberellin on Tobacco Seedlings. (T. YABUTA, Y. SUMIKI, K. ASO, and T. HAYASI). ··· 111

Studies on the Fat of *Phaseolus radiatus* L. var. *aurea* PRAIN. (1). Fatty Acids and Sterols. (NOBUO ITO). ··· 111

A Method for Determining Milk Solids in Modified Milk Powders. (Tomokiti SAKAI). ··· 112

Untersuchungen über das sogenannte „Gluconobacter." IV. Mitteilung. (Teijiro UYEMURA and Keiji KONDO). ··· 112

The Investigation of Glutamic Acid Preparation. (Part V). Experiment in a Semi-Industrial Scale. (Bunzo ROKUSHO, Rishichi TANAKA, and Hiroshi SAITO). ··· 112

Digestibility of Acorns Fed to Sheep and Rabbits. (Hisayoshi IWATA and Bunei HIROUCHI). ··· 113

Relation of Fat to Riboflavin Requirement of Growing Rats. (Ume TANGE). ··· 113

Functional Studies on Soils. (44~46). (Hideo MISU). ··· 114

On the Chemical Studies of the Bagasse Pulp. (7). (T. TADOKORO and M. NISHIDA). ··· 114

Über die Verwandlungen der chemischen Zusammensetzungen der Getreidefenniche im Wachstum. (Tetujiro OBARA). ··· 114

Study of the Insecticidal Principle in the Smoke Produced by Combusting Insect Powder. (Part VI). (Makoto NAGASE). ··· 114

Biochemical Studies on the Tissues and

Organs of the Silk Worm, *Bombyx mori* I, Part II, On the Catalase Actions of the Malpighian Vessels, (Takeo NAKASONE), ... 114

Studies on Ascorbic Acid, IV, On the Action of Ascorbic Acid on Glutathione, II, (Kichinosuke FUJIMURA), ... 115

Chemical Studies on Shark Meat (III). Isolation of Shark Meat Protein, (Kinsuke KONDO, Tadao HATA, and Seiichi KIMURA), ... 115

Über die Bestandteile der japanischen Mistel, IV, Mitteilung, Harz- und Fettsäure im Wachs, (Yataro OBATA), ... 115

Über die quantitative Bestimmung der Pyrethrine, X, Mitteilung, Über den Pyrethringehalt und den Wirkungsgrad von Moskitostäbchen, (Sankiti TAKEI, Kiyosi WAKAZONO und Keizo HIRAOKA), ... 116

Vol. 17 January 1941 No. 1

Bulletin of the Agricultural Chemical Society of Japan.

ABSTRACTS

from

TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

On Some Properties of Aldol and the Construction of *p*-Aldol.

(pp. 1~5)

By M. Hori.

(Central Research Institute, Japanese Government Monopoly Bureau;
Received December 14, 1940.)

The author studied some properties of aldol and *p*-aldol, with the results with may be summarized as follows:

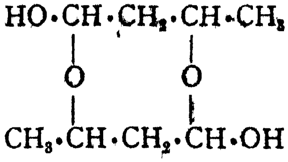
1. At room temperature aldol is a comparatively fluid substance. In existing records aldol is described as viscous liquid but the author thinks perhaps this is due to the observations on partly polymerized (to *p*-aldol) aldol.

2. Because aldol is so easy to polymerize it is hard to determine the true value of specific gravity and refractive index. The author proposes the following as approximate values:

$$D_4^{15}=1.0182 \qquad n_D^{15}=1.4292$$

3. Aldol combines with sodium bisulphite in acid medium and separates in alkaline as other aldehydes do.

4. Probably *p*-aldol has the following molecular construction:



Study of the Insecticidal Principle in the Smoke Produced by Combusting Insect Powder. (Part III.)

(pp. 6~10)

By Makoto NAGASE.

(Agricultural Chemical Department, Taihoku Imperial University, Taiwan;
Received December 13, 1940.)

In this report I have studied on the acidic and carbonyl substances in the smoke from pyrethrum. The experimental results were summarised as follows.

Acidic substances:—

54 g of acidic substances obtained from the smoke of 20 kg pyrethrum was distilled under 50 mm pressure into the following three fractions.

Fraction No.	(1)	(2)	(3)
Boiling point	up to 92°	93°	104°~108°
Yield (g)	6.0	5.5	4.5

Fraction (1) gave butyric acid *p*-iodophenacyl ester melting at 79°~80°.

Fraction (2) gave *p*-iodophenacyl ester melting at 78°~79°, and was identified as iso-valerianic acid.

Fraction (3) contained an unknown acid, making the *p* iodophenacyl ester melting at 86°.

Carbonyl substances:—

At the concentration of the original neutral substances, aldehydes were partly distilled with ether. From this etherial distillate, acet- and propionic aldehyde were obtained as 2,4-dinitrophenylhydrazones.

From the concentrated neutral substances the residual carbonyl substances were separated by sodium bisulphite. These carbonyl substances, amounting to 30 g from 20 kg of pyrethrum, were distilled by passing carbon dioxyde gas under 740 mm pressure into two fractions, up to 68° and 75°~76°. By making 2,4-dinitrophenylhydrazone, the former was decided as butyric and iso-valerianic aldehyde and the latter as iso-valerianic aldehyde.

Sterilizing Action of Acids and Phenols.

15th Report. Summaries and Conclusion on the Sterilizing Action of Phenols and Aromatic Acids.

(pp. 11~18)

By Sogo TETSUMOTO.

(Government Institute for Infectious Diseases, Tokyo Imperial University;
Received November 7, 1940.)

(1) Generally phenols and aromatic acids have a sterilizing or preventing action on the bacteria. The cause of this action is based on undissociated mole-

cules and association of pH and undissociated molecules of each reagent. But a very few reagents such as guajacol, resorcin, phloroglucin and tele phthalic acid have the promoting action for the bacteria.

(2) Phenols and aromatic acids have the tendency of reciprocal proportion between the strength of sterilizing action and numerical value of pH of each reagent like many mineral and fatty acids.

(3) Salts of aromatic acids and phenols have no sterilizing action except salts of tymol, hydroquinon, halogen phenols and NO_2 phenols, salicylic acid, gallic acid and tannic acid.

(4) We find a special relation between the chemical constitution of phenols and aromatic acids and the strength of the sterilizing action or the promoting action on the bacteria. But we could find very few common phenomena in all cases except the action of *p* isomers. Generally *p* isomers have the strongest sterilizing or preventing action on the bacterial life. The order of the strength of the sterilizing action is as follows:

1. Among cresols and di and tri OH phenols:— $m<o<p$.
   Among halogen phenols and NO_2 phenols:— $o<m<p$.
2. Among OH substituted benzoic acid isomers:— $m<p<o$.
3. Among phthalic acid isomers:— tele<iso<normal.
4. *m* isomers of di or tri OH phenols such as resorcin and phloroglucin have absolutely no sterilizing action or preventing action and have an evidently promoting action on the bacteria.

(5) The cause of difference between the chemical constitution of these reagents and the sterilizing or promoting action on the bacteria is as follows:— Each reagent has a different adsorption or consumption in the bacterial protoplasma respectively. These different rates of adsorption or consumption in the bacterial protoplasma causes the different degrees of sterilizing action or promoting action on the bacteria.

(6) *m* isomers such as resorcin and phloroglucin have no sterilizing action and have an evidently strong promoting action on the bacterial life. The cause of this is as follows:—*m*-isomers are used as the nutrients for bacteria.

(7) We find an adequate relation between the strength of the sterilizing action and numerical number of CO_2H group. In aromatic acid groups we find that there is a reciprocal proportion between the number of CO_2H group and the strength of the sterilizing action.

Studies on the Acid Fermentation by Rhizopus Species. (Part I.)

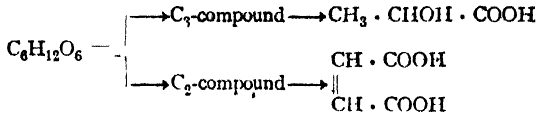
(pp. 19~22)

By K. SAKAGUCHI, T. ASAI and H. MUNEKATA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received December 21, 1940.)

In 1925 Takahashi and Sakaguchi⁽¹⁾ concluded that the 17 species of *Rhizopus* they investigated could be divided into three groups according to the nature of the acids formed from glucose; the first group forming fumaric acid mainly and none or a trace of lactic acid, the second chiefly lactic acid and none or a trace of fumaric acid, and the third forming both fumaric and lactic acids in varied proportions. As for the mechanism of the acid formation, Takahashi and Asai (1927)⁽²⁾ first demonstrated the production of fumaric acid from acetic acid by *Rhizopus* G 34, which belongs to the first group or the fumaric acid former.

In the present work the authors have found that *Rhizopus* G 36, which belongs to the second group or the lactic acid former, contrary to expectation, produced remarkable quantities of fumaric acid instead of lactic acid in the medium containing ethyl alcohol or acetic acid as the sole source of carbon. From the results obtained it is obvious that if C_2-compounds are used as the carbon sources even the lactic acid former shows the ability of forming fumaric acid. The following scheme, therefore, can be assumed for the acid production by *Rhizopus* species:



$$C_6H_{12}O_6 \begin{cases} \longrightarrow C_3\text{-compound} \longrightarrow CH_3 \cdot CHOH \cdot COOH \\ \longrightarrow C_2\text{-compound} \longrightarrow \begin{matrix} CH \cdot COOH \\ \| \\ CH \cdot COOH \end{matrix} \end{cases}$$

Since remarkable amounts of ethyl alcohol have been produced from acetic acid along with fumaric acid by both the fumaric and lactic acid formers, it may be assumed that a simultaneous dehydrogenation is necessary for the condensation of these C_2-compounds to fumaric acid. It is not clear, however, why the lactic acid former does not produce fumaric acid from glucose, while it produces abundant quantities of ethyl alcohol from glucose as shown below.

The assumption that fumaric acid was derived from the substance of mycelium or from carbohydrates, which were previously synthesized from acetic acid, proves to have little evidence for support, since fumaric acid and not lactic acid was the only product from acetic acid by the lactic acid former.

(1) T. Takahashi and K. Sakaguchi: J. Agr. Chem. Soc (Japan), 1, 344 (1925).
(2) T. Takahashi and T. Asai: ibid., 3, 589 (1927).

On the Biochemical Properties of Diphtheria Toxin.

(pp. 23～24)

By Tetutaro TADOKORO and Tuneyuki SAITO.

(Hokkaido Imperial University; Received December 4, 1940.)

Studies on the Determination of Vitamin B_1 in Various Food Materials by the Thiochrome Method.

(pp. 25～36)

By Hisasi ARIYAMA, Ryusaku HOSINO and
Yosisaburo NAKAZAWA.

(From the Laboratory of Food Supplies, the Yokosuka Naval Bureau of Munitions;
Received December 13, 1940.)

To make the thiochrome method applicable to the determination of vitamin B_1 in various food materials, the authors modified Jansen's original method in some respects, and obtained satisfactory results.

The modified procedure is as follows:

The food materials are extracted with water or 50% ethanol according to the kind and amount of extractive matters which will be extracted along with vitamin B_1 and the filtered solutions are evaporated to a proper concentration in vacuo. Then the solutions obtained, after being treated with ether, are incubated with a suitable amount of Kasiwagi diastase, a commercial diastase preparation, for 24 hours at 45°C. Then the solutions are agitated with the proper amount of purified acid clay and the acid clay is collected, washed and dried. (If necessary, the concentrated solutions are treated with absolute ethanol before agitation with acid clay.) The activated acid clay is treated as usually with potassium ferricyanide in alkaline solution and vitamin B_1 is converted to thiochrome. Vitamin B_1 value is obtained by matching the blue fluorescence, which the thiochrome solution in iso-buthanol produces in u. v. light, with the standard solution of pure vitamin B_1, using the ordinary Duboscq colorimeter. The results of determination on 16 kinds of cereals and cereal products, 9 kinds of vegetables, 12 kinds of fish and meat and 12 kinds of commercial vitamin B_1 preparations are presented. Furthermore, the authors made the determination of vitamin B_1 contained in three kinds of cooked diet and ascertained that as long as "Haigamai," rice so hulled as to retain embryo, was used as the staple food, the vitamin B_1 supply was enough to cover the daily requirement.

Chemical Researches on the Pulp Woods of Siam.
Part I.

(pp. 37~46)

By Masuzo SHIKATA, Yoshitsugu KIMURA, Kozo NAKAMURA
and Shinzo HACHINOE.

(Kyōto Imperial University; Received December 17, 1940.)

In this paper, the researches on the chemical components, fibre-length, and cooking experiments of hard woods of Siam are given.

The species of the woods employed are as follows:—

Samples	Siamese name	Botanical name
No. 1	Mai Sa	Broussonetia papyrifera
No. 2	Mai Kratoom Boke	Anthocephalus cadamba
No. 3	Mai Jang	Niebuhria Siamensis
No. 4	Mai Pormuen	Hibiscus sp.
No. 5	Mai Por Keegai	Grewia sp.
No. 6	Mai Makok	Spondias mangifera
No. 7	Mai Duae	Ficus spp.
No. 8	Mai Chanuan	Dalbergia sp.
No. 9	Mai Ngiu pa	Bombax spp.
No. 10	Mai Khoi	Streblus asper
No. 11	Mai Por e geng	Streculia sp.
No. 12	Mai Jun	Milletia sp.
No. 13	Mai Yompa	Ailanthus sp.

The data are given in Table I.

For cooking experiment Ca-sulphite process was adopted.

Table I. Experimental Data.

Species / Physical properties	No. 1 Mai Sa	No. 2 Mai Kratoom Boke	No. 3 Mai Jang	No. 4 Mai Pormuen	No. 5 Mai Por Keegai	No. 6 Mai Makok	No. 7 Mai Duae	No. 8 Mai Chanuon	No. 9 Mai Ngiu pa	No. 10 Mai Khoi	No. 11 Mai Poregeng	No. 12 Mai Jun	No 13 Mai Yompa
Annual rings	6	11	50	12	5	12	8	9	30	10	12	13	15
Diameter (cm)	9.5	27.5	23.5	7.9	9.5	27.2	22	18.5	26.4	24.5	13.0	23.0	25.2
Fibre-length (mm)	0.81	1.41	0.88	1.58	1.24	1.36	1.34	1.14	2.29	1.21	2.02	1.15	1.37
Volume weight	0.38	0.61	0.64	0.49	0.60	0.33	0.33	0.56	0.29	0.49	0.34	0.61	0.34
Species / Chemical Components													
Alcohol-benzene-soluble	0.98	4.06	0.54	0.33	1.32	1.65	1.15	1.15	0.92	2.28	2.05	2.18	1.63
Water-soluble	1.47	6.18	12.57	10.23	2.13	5.19	5.83	3.54	6.50	6.23	3.62	3.39	1.23
Hot-water soluble	2.65	6.94	14.80	11.11	2.32	6.12	7.99	4.08	10.97	10.07	6.56	5.83	3.23
1% NaOH soluble	16.77	13.79	24.59	20.08	13.90	24.70	18.52	12.73	26.8	12.94	17.44	11.53	7.51
Crude cellulose	58.75	49.03	47.09	57.50	53.65	57.86	54.46	58.79	53.41	47.17	55.13	53.50	59.87
α-cellulose	45.58	36.68	35.20	40.56	43.74	43.38	41.24	47.08	36.32	31.87	45.74	34.78	37.41
β-cellulose	12.52	3.76	5.46	6.66	2.42	5.65	3.63	5.64	12.34	6.31	2.78	16.44	15.46
γ-cellulose	0.65	8.59	7.03	10.28	3.56	8.83	9.59	6.07	4.75	10.99	6.61	2.28	7.00
Lignin	23.24	22.81	25.58	26.59	26.48	18.89	31.55	26.98	27.70	30.51	29.25	24.55	24.62
Pentosan	18.67	15.54	16.99	14.08	16.08	17.27	13.30	14.47	8.58	16.30	14.74	14.19	15.55

Galactan	1.41	0.63	13.43	8.70									
Hemi-cellulose	20.09	16.18	30.42	32.78									
Nitrogen	0.09	0.06	1 16	1.09									
Crude protein	0.56	0.38	7.23	6.83									
Ash	1.00	2.29	1.93	1 12	1.03	1.69	1.93	1.57	1.52	3.59	1.39	1.83	1.29
Methoxyl	5.79	7.38	5.39	6.19									
Methoxyl/Lignin × 100	24.91	22.48	21.20	23.58									
Ca-Pectic acid	0.44	0 41	3.17	1.97									
In total cellulose α-cellulose	77 58	74.81	73.44	72.35	88.85	74.98	75.73	80.08	68.00	64 82	82.97	65.01	62.49
In total cellulose β-cellulose	21 14	7.67	11.68	11.59	4.51	9.76	6.66	9.59	23.10	12 83	5.07	30.73	25.82
In total cellulose γ-cellulose	1.28	17.57	14.88	16.06	6.64	15.26	17.67	10.33	8.90	22.35	11.99	4.26	11.68
Species / Yield and Analysis of Unbleached Pulps													
Yield to chip	48.0	39.1		43.82	42.0	45.38	41.68	41.63	43.82	39.13	39.25	42.25	45.25
Yield to 1m³ wood (kg)	185.22	237.67		217.03	252.0	149.7	137.5	233.1	157.53	191.7	133.4	257.7	153.8
Total cellulose	96.94	92.63		93.30	93.85	95.62	85.66	87.06	96.09	89.42	89.14	82.91	92.16
α-cellulose	80.97	84.93		88.97	83.58	81.06	74.78	69.24	88.15	77.18	70.02	63.25	81.45
β-cellulose	11 44	6.37	Cooking impossible	2.52	6.95	8.91	10.26	10.44	5.21	11.31	16.61	17.41	5.72
γ-cellulose	4.53	8.70		6.81	3.32	5.65	0.62	1.38	2 73	0.93	2.51	2.25	4.99
Pentosan	8.6	6.27			3.36	3.85	5.75	4.52	3.46	6.75	6.89	1.94	4.75
Poe's number	1.85	6.06		0.95	0.85	1.22	6.62	2.24	6.13	3.00	4.43	2.73	1 51
Ash	0.38	0.31		0.67	1.12	1 30	2.61	2.43	0.73	0.12	1.20	1.95	0.51

Vol. 17 *February 1941* *No. 2*

Bulletin of the Agricultural Chemical Society of Japan.

ABSTRACTS
from
TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Über die Beseitigung der hemmenden Wirkung des Furfurols durch Natriumsulfit.

(Besonders in Bezug auf ein Verfahren, die Maisch durch Säureverzuckerung zu verbessern.)

(ss. 47～51)

Von Shinichiro BABA.

(Aus dem Agrikulturchem. Laboratorium der Kaiserl. Tokio Universität;
Eingegangen am 23. Dez. 1940.)

Diese Untersuchung betrifft die Tatsache, dass das bei der Säureverzuckerung unvermeidlich entstehende Furfurol durch Na_2SO_3 desodorisiert, und seine hemmende Wirkung dadurch aufgehoben wird.

In Fallen von Zitronensäuregärung durch *Asp. niger*, Alkoholgärung durch Brennereihefe (Br. H.˙30) und 2,3-Butylenglykolgärung durch die Aerogenesgruppe, wird die Hemmungswirkung des Furfurols durch Na_2SO_3 beseitigt, wodurch eine Zunahme der Ausbeute und Verkürzung der Gärungszeit erfolgt.

Nach der Beendigung jeder Gärung verschwindet das Furfurol, aber im Fall einer zusätzlichen Beifügung von Na_2SO_3 liegt die Sache ganz anders.

Es entsteht ein brotähnlicher Geruch. C. J. Lintner und H. J. v. Liebieg haben diese geruchgebende Substanz Furylalkohol genannt.

Für die freundliche Hilfe bei dieser Untersuchung spreche ich meinen verbindlichsten Dank Prof. Dr. Sakaguchi, dem ausserordentlichen Professor Dr. Asai und den Herren des Seminars aus.

An Iodometric Method for the Determination of the Sum of Aldol and *p*-Aldol Existing together with Acetaldehyde.

(pp. 52~54)

By M. Hori.

(Central Research Institute, Japanese Government Monopoly Bureau;
Received January 22, 1941.)

An iodometric method is given by the author for the determination of acetaldehyde and the sum of aldol and *p*-aldol in the mixture of them. The method is based on the facts that *p*-aldol decomposes to aldol in the aqueous solution of sodium bisulphate and that aldol combines with sodium bisulphate in acid medium and separates in weak alkaline solution.

On the Regenerated Brown Forest Soil in North-east Manchuria.

(pp. 55~63)

R. Kawashima and M. Nagata

(Agr. Chem. Laboratory, Kyushu Imp. University; Received Jan. 6, 1941)

The soil profiles now examined exhibit a pretty distinct bleached layer and a good developed illuvial layer. From the viewpoint of soil morphology, they must have been strongly podzolized brown forest soils.

Owing to the influence of long continued steppe-like condition after deforestation, they have profoundly regenerated. The results of chemical analyses verify this fact. Therefore, in spite of the bleached layer being still preserved, the soil has almost lost the original podzolized character.

Besides this, a good correlation exists between humidity and chemical properties of soil.

On the Occurrence of Threonine in Meat-proteins of Some Marine Animals.

(pp. 64~66)

By Mrs. Yasu Hatakoshi.

(Kondo Laboratory, Chemical Institute, Kyoto Imperial University;
Received Jan. 8, 1941.)

Chemical Studies on Clay-soil under Water. (Part II).

On the Chemical Constituents of Shallow Water Deposit
Along the Coast of Chosen.

(pp. 67～70)

By Masayoshi Ishibashi.

(Chemical Institute, College of Science, Kyoto Imp. University;
Received Jan. 15, 1941.)

Untersuchungen über die Beziehungen von Bataten zur Alkoholproduktion. II.

(SS. 71～90)

Von Y. Takeda, K. Suematu und M. Utikosi.

(The Institute of Research on Chemical Industry, Government-General of Taiwan;
Received December 27, 1940.)

Dietary Studies on the Increase of Utilizing Value of Northern Farm Animals. (II).

Hair Growth and Feed. (Rabbit).

(pp. 91～96)

By E. Takahashi and K. Shirahama.

(Agricultural Chemical Laboratory, Hokkaido Imperial University;
Received Dec 30, 1941)

On the Stimulant for Cane Sugar Formation in Plants. (VIII.)

(pp. 97～100)

By Tetutaro Tadokoro and Masao Nisida.

(Hokkaido Imperial University; Received Jan. 13, 1941.)

Studies on the Nutritional Chemistry of the Cuttle-fish. III.

The Mineral Composition of Meat and Liver of Cuttle-fish and Liver Amylase.

(pp. 101～106)

By Mrs. Yasu Hatakoshi.

(Kondo Laboratory, Chemical Institute, Kyoto Imperial University:
Received Jan. 8, 1941.)

Functional Studies on Soils. (XI～XII).

(pp. 107～114)

By Misu-Hideo.

(Agricultural Experiment Station, Government General of Tyôsen;
Received Jan. 11, 1941.)

Über den Brechungsexponenten der Proteinlösung.

(ss. 115～121)

Von S. Shinano.

(Aus dem Laboratorium des chemischen Instituts, Kaiserliche Universität zu Kyoto.
Leiter: Prof. Dr. K. Kondo.; Eingegangen am 8. 1. 1941.)

Ich habe den Brechungsexponenten der alkalischen Proteinlösungen von Krabbenfleisch-, Krebsfleisch-Protein und Klebreis-Glutelin unter Benutzung des Refractometers von Pulfrich und der Lichtquelle Na-Lampe gemessen.

(1) Der Brechungsexponent der Proteinlösungen in der konstanten Alkalikonzentration des Lösungsmittels und in der verschiedenen Konzentration des Proteins in der Lösung.

(a) Der eigentümliche Unterschied zwischen dem Brechungsvermögen des obenerwähnten Proteins ist nicht erkannt worden.

(b) In den drei oben erwähnten Proteinlösungen steigen die bezüglichen Kurven zwischen dem Brechungsvermögen und den Protein-Konzentrationen geradläufig herab.

Ich erläuterte diese Erscheinung zum Ergebnisse der Zersetzung von einem Teile des Proteins mittels des überschüssigen NaOH in der Lösung, also war der Brechungsexponent der Proteinlösungen nicht im Verhältnisse zu den Konzentrationen des Proteins in den Lösungen.

(2) Der Brechungsexponent der Proteinlösungen in der konstanten Konzentration des Proteins in den Lösungen und in der verschiedenen Alkalikonzentration des Lösungsmittels.

Ich habe den Brechungsexponenten der alkalischen Proteinlösungen von Klebreis-Glutelin (0.839%) gemessen.

Die Folge davon war, dass der Brechungsexponent der Proteinlösungen nicht im Verhältnisse zu der Konzentration des Proteins in der Lösung war.

Ich erklärte diese Erscheinung mittels der Theorie, Komponent-System von S. P. L. Sörensen über das Protein, welche in Japan die Unterstützung und die Entwicklung von K. Kondo erhalten hat.

(Am 19. September 1940)

Vol. 17 March 1941 No. 3

Bulletin of the Agricultural Chemical Society of Japan.

ABSTRACTS
from
TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

On the Changes in the Lacto-flavin Contents of Silkworms (Bombyx mori L.) during Metamorphosis.

(pp. 123~126)

By B. MARUO and H. KOIKE.

(Laboratory of Katakura Silk Factory, Omiya; Received January 28, 1941.)

Studies on the Propionic Acid Fermentation. Part I.

(pp. 127~138)

By Kinichirô SAKAGUCHI, Mamoru IWASAKI and Syûzô YAMADA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received February 1, 1941.)

SUMMARY.

12 cultures of propionic acid forming bacteria have been isolated from 11 samples of cheese of which 4 were of Japanese origin. Through cultural and physiological studies these cultures have been separated into 6 groups which deviate from previously described species(1) in various characteristics. These strains can be clearly differentiated from each other on the morphological and biochemical properties as shown in the following classification.

The Morphological Classification	*The isolated strains*	*The Classification based on the acid production*
[I] Short rods		[I] Acid from starch
[A] Irregular forms in acid media		[A] Acid from sucrose and maltose
(1) Surface growth in stab small and dome-shaped		(1) Acid from arabinose
(a) Colonies upon lactate media orange colored	—— No. 11 ——	
(b) Not orange colored	—— No. 3 ——	

〔B〕 Normal forms in acid media		[II] No acid from starch
(1) Surface growth in stab somewhat expanded and flat		〔B〕 Acid from sucrose but not from maltose
(a) Colonies brownish red	—— No. 13 ——	(2) No acid from arabinose (acid from glycerol and erythritol)
(2) Surface growth in stab small and dome shaped		〔C〕 No acid from sucrose or maltose
(a) Colonies cream colored	—— No. 6 ——	(1) Acid from arabinose
[II] Small streptococci		
〔A〕 Normal forms in acid media		
(1) Surface growth in stab somewhat expanded and flat		
(a) Colonies cream colored	—— No. 1 ——	(2) No acid from arabinose (No acid from glycerol or erythritol)
〔B〕 Irregular forms in acid media		
(1) Surface growth in stab scanty		〔A〕 Acid from sucrose and maltose
(a) Colonies cream colored	—— No. 14 ——	(1) Acid from arabinose

The distinct separation of these strains from the previously described species may be seen from the fact that the following supplementary modifications proved to be necessary to fit these new strains into the keys for the identification of the species of Propionibacterium presented by Werkmann(2) and Van Niel(1). The supplemented parts are italicised in the following keys:

The key by Werkmann and Brown(2) (modified by the authors to include the new strains).

A. Attacking sucrose and maltose
  B. Attacking polysaccharides
    C. Attacking lactose and arabinose
      D. Attacking rhamnose and trehalose, not attacking raffinose *and xylose*, catalase negative ——Propionibac. arabinosum
      DD. Not attacking rhamnose, trehalose *and xylose*, attacking raffinose, catalase positive ——Propionibac. technicum
      DDD. Not attacking raffinose, attacking xylose, catalase positive
        E. Colonies on lactate media orange coloured ——No. 11
        EE. Colonies on lactate media not orange coloured ——No. 3
    CC. Not attacking lactose and arabinose ——Propionibac. zeae
  BB. Not attacking polysaccharides
    C. Attacking xylose and arabinose, nitrates reduced ——Propionibac. pentosaceum
    CC. Not attacking xylose and arabinose, nitrates not reduced
      D. Attacking raffinose
        E. Pigment yellow ——Propionibac. raffinosaceum
        EE. Pigment red brown ——Propionibac. rubrum
      DD. Not attacking raffinose
        E. Attacking mannitol, not attacking sorbitol
          F. Attacking amygdalin and salicin ——Propionibac. Peterssonii
          FF. Not attacking amygdalin and salicin ——Propionibac. Jensenii
        EE. Not attacking mannitol, attacking sorbitol ——Propionibac. Thoenii
    CCC. Not attacking xylose, attacking arabinose, nitrates not reduced ——No. 4 (streptococci)
AA. Not attacking sucrose and maltose
  B. Attacking lactose, nitrates not reduced ——Propionibac. Shermanii (*streptococci*)

BB. Not attacking lactose, nitrates reduced ——Propionibac. Freudenreichii (*streptococci*)

BBB. Attacking lactose, nitrates reduced ——No. 6 (short rods)

AAA. Attacking sucrose, not attacking maltose, nitrates reduced

B. Attacking glycerol and erythritol ——No. 13 (short rods)

BB. Not attacking glycerol and erythritol ——No. 1 (streptococci)

The key by Van Niel(1) (modified by the authors to include the new strains).

I. In yeast extract dextrose media growth occurs in the form of small streptococci. Dirty cream-colored growth in stabs, with slight surface growth of same color. Sucrose and maltose not fermented.

A. Not fermenting lactose ——Propionibact. Freudenreichii

AA. Fermenting lactose ——Propionibact. Shermanii

I I. In yeast extract dextrose media growth occurs in the form of small streptococci. Irregulary elongated cells in acid media. Dirty cream-colored growth in stabs, with slight surface growth. Sucrose and maltose are fermented.

——No. 4

I I I. In yeast extract dextrose media growth occurs in the form of small streptococci. No variation of cell form in acid media. Dirty cream coloured growth in stabs, with expanded and flat surface growth. Sucrose is fermented but not maltose. ——No. 1

II. In yeast extract dextrose media growth occurs in the form of typical short rods of diphtheroid appearance. Distinct surface growth in stabs. Sucrose and maltose are fermented.

A. Growth brownish red

1. Ferments raffinose and mannitol, but not sorbitol

——Propionibac. rubrum

2. Ferments sorbitol, but not raffinose and mannitol

——Propionibac. Thoenii

B. Growth in stab cream colored

1. Surface growth cream colored

a. Ferments *l*-arabinose and rhamnose ——Propionibac. zeae

2. Surface growth yellow to orange

a. Growth in liquid media flocculent, as if agglutinated

——Propionibac. Peterssonii

aa. Growth in liquid media dispersed, smooth

b. Do not ferment dextrin, glycogen and starch

——Propionibac. Jensenii

——Propionibac. raffinosaceum

bb. Ferments dextrin, glycogen and starch

——Propionibac. technicum

——No. 11 (?) and No. 3 (?)

II II. In yeast extract dextrose media growth occurs in the form of typical short rods of diphtheroid appearance. Distinct surface growth in stab. Sucrose and maltose are not fermented. ——No. 6

II II II. In yeast extract dextrose media growth occurs in the form of typical short rods of diphtheroid appearance. Surface growth somewhat expanded and flat. Ferments sucrose but not maltose. Growth brownish red.

——No. 13

III. In yeast extract dextrose media growth occurs in the form of highly irregular cells, giving the appearance of involution forms. Distinct surface growth in stabs. Both *l*-and *d*-arabinose are fermented.

A. Involution forms large, swollen spheres, surface growth orange yellow,

does not ferment xylose and rhamnose ——Propionibac. arabinosum

B. Involution forms long, irregular rods. Surface growth cream colored.
Ferments xylose and rhamnose ——Propionibac. pentosaceum
——*No. 3* (?)

BB. *Involution forms long, irregular rods. Surface growth orange yellow.*
***Ferments xylose.* ——*No. 11* (?)**

The properties of the isolated bacteria.

(1) Propionibacterium globosum nov. sp.

Culture. No. 1.

Morphology. In sodium lactate broth at 30°C, $0.5\mu \times 0.6\mu$, single coccus, occasionally in chains, no metamorphosis in acid media, assuming long forms, $0.6\mu \times 3\sim5\mu$, under aerobic conditions. Non-motile. Spore not formed. Gram-positive.

Cultural characteristics. Liquid media: No or little turbidity; cream-colored, somewhat flocculent sediment.

Agar stab: Both in sodium lactate and glucose bouillon agar, growths are abundant with stretched surface growth. No pigment, creamy.

Litmus milk: completely decolorized, acid, coagulated.

Physiology. Catalase positive, nitrates reduced to nitrites, indol negative, H_2S not produced and gelatin not liquefied. Optimum temperature for acid production $33°\sim34°$C. Optimum pH 7.0. Killed at 75°C, in 10 minutes. Acid from fructose, glucose, galactose, mannose, lactose and saccharose. No acid from xylose, arabinose, maltose, raffinose, dextrin, starch, inulin, dulcitol, mannitol, glycerol, erythritol, salicin and amygdalin.

Propionic and acetic acids are produced from glucose in the ratio of about 2 : 1.

(2) Propionibacterium amylaceum nov. sp.

Cultures. No. 3 (9 and 10).

Morphology. In sodium lactate broth at 30°C, the cells appear as short rods, $0.6\mu \times 1.2\sim1.5\mu$, in acid media long irregular cells, $0.6\mu \times 7\sim8\mu$. Under aerobic conditions, straight shorter rods, about $0.6\mu \times 4\sim5\mu$. Non-motile. Spore not formed. Gram positive.

Liquid media: Distinctly turbid with grayish-creamy, ropy sediment.

Agar stab: both in sodium lactate and glucose bouillon agar pin head shaped small surface growth, abundant ropy stab growth. Gas production. No pigment.

Litmus milk completely decolorized, acid and coagulated.

Physiology. Catalase positive, nitrates not reduced, indol negative, H_2S not liquefied.

Optimum temperature for acid production $30°\sim34°$C. Optimum pH 6.8. Killed at 70°C in 10 minutes. Acid from xylose, arabinose, fructose, glucose, galactose, maltose, mannose, lactose, saccharose, dextrin, starch, mannitol, glycerol, erythritol, salicin and amygdalin.

No acid from raffinose, dulcitol and inulin.

Propionic and acetic acids are produced from glucose in the ratio of about 4.7 : 1.

(3) Propionibacterium japonicum nov. sp.

Cultures. No. 4 (and 5).

Morphology. In sodium lactate broth at 30°C, spherial, 0.6 μ × 0.6 μ; in acid media cells appear as long rods, 0.6 μ × 8 μ. Non-motile. Spore not formed. Gram positive.

Liquid media: No or little turbidity; cream colored, flocculent sediment.

Agar stab: both in sodium lactate and glucose bouillon agar, growths slight, with little or no surface growth. No pigment.

Litmus milk: decolorized but not coagulated.

Physiology. Nitrates not reduced to nitrites, indol negative, H_2S not produced, gelatin not liquefied.

Produce little or no catalase power.

Optimum temperature for acid production 30°C, optimum pH 7.0~7.2. Killed at 70°C in 10 minutes. Acid from arabinose, fructose, glucose, galactose, maltose, mannose, lactose, saccharose, dextrin, mannitol, salicin and amygdalin.

No acid from xylose, raffinose, starch, dulcitol, inulin, glycerol and erythritol.

Propionic and acetic acids are produced from glucose in the ratio of about 2.2 : 1.

(4) Propionibacterium orientum nov. sp.

Cultures. No. 6 (8_1 and 8_2).

Morphology. In sodium lactate broth at 30°C, the cells appear as short rods, 0.5~0.6 μ × 1.0~1.2 μ, no metamorphosis in acid media, assuming long forms, 0.6 × 4~5 μ, under aerobic conditions. Non-motile. Spore not formed. Gram positive. Liquid media: Distinctly turbid; smooth creamy sediment.

In agar cultures, both in sodium lactate and glucose bouillon agar, growths abundant, "beads-connected," with moderate surface growth.

Gas produced. Pigment: slight yellowish, if present.

Litmus milk: decolorized, acid, coagulated.

Physiology. Catalase positive; nitrates reduced to nitrites; indol negative; H_2S not produced; gelatin not liquefied.

Optimum temperature for acid production, 34°C. Optimum pH 7.0~7.2. Killed at 75°C in 10 minutes. Acid from arabinose, fructose, glucose, galactose, mannose, lactose, glycerol and erythritol.

No acid from xylose, maltose, saccharose, raffinose, dextrin, starch, dulcitol, inulin, mannitol, salicin and amygdalin.

Propionic and acetic acids are produced from glucose in the ratio of about 1.8 : 1.

(5) Propionibacterium amylaceum nov. sp. var. aurantium nov. var.

Culture. No. 11.

Morphology. In sodium lactate broth at 30°C, short rods, $0.6\,\mu \times 1.2\sim1.5\,\mu$; in acid media, irregular long form $0.6 \times 7\sim8\,\mu$; assuming straight rods, $0.6\,\mu \times 4\sim5\,\mu$, under aerobic conditions. Non-motile. Spore not formed. Gram positive.

Liquid media: Distinctly turbid with grayish-creamy, ropy sediment.

Agar stab: both in sodium lactate and glucose bouillon agar, growths are bundant and ropy, with pin-head sized moderate surface growth.

Gas produced. Orange yellow pigment in sodium lactate medium.

Litmus milk: Completely decolorized, acid, coagulated.

Physiology. Catalase positive, nitrates not reduced to nitrites. Indol negative, H_2S not produced. Gelatin not liquefied.

Optimum temperature for acid production, 30°C. Optimum pH $5.6\sim6.8$. Killed at 70°C in 10 minutes. Acid from xylose, arabinose, fructose, glucose, galactose, maltose, mannose, lactose, saccharose, dextrin, starch, mannitol, glycerol, erythritol, salicin and amygdalin.

No acid from inulin, dulcitol and raffinose.

Propionic and acetic acids are produced from glucose in the ratio of about 3.8 : 1.

(6) Propionibacterium coloratum nov. sp.

Cultures. No. 13. (and 1_2)

Morphology. In sodium lactate broth at 30°C, short rods, $0.6\,\mu \times 1.0\sim1.2\,\mu$, no metamorphosis in acid media, assuming long forms, $0.6\,\mu \times 3\sim5\,\mu$, under aerobic conditions. Non-motile. Spore not formed. Gram positive.

Liquid media: Distinctly turbid in early stages, ropy sediment.

Stab culture: Both in glucose and sodium lactate bouillon agar, growths are moderate and ropy with somewhat stretched surface growth.

Gas produced.

Litmus milk: complete decolorization, acid, coagulation.

Physiology. Catalase positive, nitrates reduced to nitrites, indol negative, H_2S not produced, gelatin not liquefied.

Optimum temperature for acid production 34°C, optimum pH $6.5\sim6.8$. Killed at 75°C in 10 minutes.

Acid from fructose, glucose, galactose, mannose, lactose, saccharose, glycerol and erythritol. No acid from xylose, arabinose, maltose, raffinose, dextrin, starch, inulin, dulcitol, mannitol salicin and amygdalin.

Propionic and acetic acids are produced from glucose in the ratio of about 2.5 : 1.

---

(1) Bergey's Man. of Det. Bact. 1939, 5th Ed.

(2) Werkmann and Brown: Journ. Bact. 26, 400, 1933.

Über eine neue Quantitative Analyse des Eisens.

(SS. 139～143)

Von Shinichiro BABA.

(Aus dem Agrikulturchem. Laboratorium der Kaiserl. Universität Tokio; Eingegangen am 27. 1. 1941.)

Dieses Verfahren bezweckt, eine einfache Massanalyse zu finden, in der die Farbenreaktion des Ferrisalzions durch gelbes Blutlaugensalz verwendet wird.

Die Farbenreaktion durch das gelbe Blutlaugensalz ist sehr scharf, und in Ansäuerung der Schwefelsäure wird es bis zu etwa 1/10000 gefärbt, weshalb der Anwendungsumfang dieses Verfahrens auf dieses Mass beschränkt ist.

Der Gehalt des Eisens in der Laugeprobe soll nicht mehr als 1 mgr. sein.

Durch dieses Verfahren gewinnt man eine kleinere Menge als durch die Gewichtsanalyse. Die Differenz beträgt −8.4 %.

Ammoniumsulfat und Ferrosalz stören die Ausführung dieses Verfahrens. Deshalb muss das Ferrosalz durch Salpetersäure zum Ferrisalz umgewandelt werden.

Bei den Substanzen, welche die Azidität durch die Oxydation anzeigen, kann die Differenz der Titrierung durch das Neutralrot beseitigt werden.

Für die freundliche Hilfe bei dieser Untersuchung sage ich an dieser Stelle meinen verbindlichsten Dank den Herren Prof. Dr. K. Sakaguchi, a. o. Professor Dr. T. Asai, a. o. Proffessor Fujihara, den Herren des Seminars und Herrn Ozaki.

On the Brown Forest Soil in the Upper Region of the Non River, North Manchuria.

(pp. 144～148)

By R. KAWASHIMA and M. NAGATA.

(Agricultural Chemical Laboratory, Kyushu Imperial University; Received February 1, 1941.)

A brown forest soil of good quality is widely distributed along the upper course of the Non River of North Manchuria. The parent material of the soil is diluvial deposit. The soil texture is composed of fine clay and the A_1 layer contains a good quantity of humus.

For the region now concerned is exhibited the functional relationship between humidity and soil properties. The mean annual temperature in this region does not differ much and the annual precipitation increases from south to north, and so the humidity is increasing in that direction.

In company with the increasing humidity, the following correlations are observed:

i Both the clay and nitrogen contents increase.
ii Both the pH-values and degrees of base saturation decrease.
iii The total exchange capacities increase.

In an appended map in Thorp's book(1), the soil type of this region is recorded as a chernozem, but this is a mistake.

---

(1) J. Thorp: Geography of the Soil of China. 1936. (Nanking)

On the Preparation and Some Properties of Yeast Amylase.

(pp. 149～152)

By Reitaro MURAKAMI.

(Utunomiya Agricultural College; Received February 7, 1941.)

Functional Studies on Soils. (XI～XII).

(pp. 153～160)

By MISU-Hideo.

(Agricultural Experiment Station, Government General of Tyôsen;
Received January 11, 1941.)

Ein synthetischer Versuch von β-Indol-essisäure (Indol-3-essigsäure).

(SS. 161～164)

Von Sankiti TAKEI u. Takenosuke TAKANO.

(Aus d. Institut f. Chem. Forschung, Kaiserl. Universität Kyoto;
Eingegangen am 11. 2. 1941.)

On the Fermentation Degumming of Waste Silk. Part VI.

The Action of Degummase and Thermodegummase upon Protein Substances.

(pp. 165~170)

By Hideo KATAGIRI and Toshio NAKAHAMA.

(Agricultural Chemical Laboratory, Kyoto Imperial University:
Received February 26, 1941.)

It was ascertained in the previous paper that the active centre of the useful bacteria BACILLUS CEREUS and BACILLUS ROBUSTUS for fermentation degumming was due to soluble enzymes named degummase and thermodegummase respectively.

The preparations of these enzymes were obtained in the following manner: the cultural solution was evaporated under reduced pressure after being dialysed with collodium membrane, and precipitated by acetone.

With these preparations, all the protein substances: glycyl glycin, chloracetyl *l* tyrosin, leucyl diglycin, peptone, gelatin, egg albumin, sericin, edestin and casein, were attacked. With degummase (op. pH = 6.0, op. temp. = 40°) glycyl glycin and casein were readily decomposed and edestin was slightly attacked, while very remarkable decomposition of gelatin and edestin was observed with thermodegummase (op. pH = 7.5, op. temp. = 55°).

It was therefore reasonable that these bacteria were useful for the degumming of waste silk, since degummase and thermodegummase were composed of protease system including proteinase, aminopolypeptidase, dipeptidase and carboxypeptidase.

Researches on "Maoran" as a Raw Material for Paper Pulp and Rayon Pulp.

(pp. 171~191)

By Motô YAMANE and Tomizô MATUI.

(Chemical Laboratory, Hukokuseni Kogyo; Received January 28, 1941.)

In this paper, the researches on chemical components and cooking experiments of "Maoran" (New Zealand flax, *Phormium tenax*) are described.

— —

On the Fixation of Silk-Sericin with Formaldehyde.

(pp. 192～196)

By Tosio NAKAHAMA and Ikuzo SAKAGUCHI.

(Kanebo Yamashina Institute; Received February 3, 1941.)

On the fixation of silk-sericin with formaldehyde solution, we have first studied the optimum concentration, temperature and pH of the aldehyde solution, and then the optimum period of treatment and the influence of sodium chloride.

The experimental results are summarized as follows:

(1) The optimum conditions of aldehyde solution for the fixation of sericin were found to be

Concentration...............4 % Period of treatment......3 hour

Temperature ....50°C pH ....about 7

(2) The adsorption phenomenon of formaldehyde on natural silk was observed according to the formula of Freundlich's adsorption isotherm using a dilute solution of less than 4 % form aldehyde.

(3) Sodium chloride did not reveal any remarkable influence on the fixation of sericin with aldehyde.

Biochemical Studies on Diphtheria Toxin. (2nd report)

(pp. 197～198)

By Tetutaro TADOKORO, Tuneyuki SAITO
and Naomoto TAKASUGI.

(Hokkaido Imperial University; Received February 12, 1941.)

On the Hydrolysis of Fats and Fatty Acid Esters. (9).

(pp. 199～209)

By Toyoki ONO.

(Chemical Laboratory of the Fish Meal Association of Japan;
Received February 14, 1941)

Relation between the Unsaturation of Oils and their Hydrolyses.

Some authors have reported that the velocity of hydrolysis of fats and oils is influenced by their unsaturation. In previous paper, however, I have described that these facts are not observed at ordinary temperature, but the higher unsaturated oils have greater velocity of hydrolysis than the lower unsaturated or saturated ones at such a low temperature as −4°C.

To solve those problems the following experiments were carried out, and my previous works were perfectly proved by these results.

EXPERIMENTS and RESULTS.

Eight samples were taken as the higher unsaturation oils (perilla, linseed and sardine oils), the lower unsaturated oils (olive and soya bean oils) and saturated oils (cacao butter, cocoa nut oil and lard).

The velocity of hydrolysis was determined at 30°, 0° and −4°C with pancreas and ricinus lipase. The results are summarised in Table 8.

(1). As in my previous works, it was distinctly observed that there is no relation between the hydrolysis and the unsaturation at 30°C.

(2). At 0° and −4°C, however, the velocity of hydrolysis diminishes in order of the higher unsaturated, the lower unsaturated and saturated oils.

(3). Such a fact on hydrolysis at lower temperature is due to the physico-chemical properties, mainly the surface tension, of emulsions. Table 9 showes this explanation.

Table 8. Influence of the Unsaturation of Fats and Oils on their Hydrolysis.

Fat and oils	Iodine number	Pancreas lipase		Ricinus lipase					
		30°C		30°C		0°C		−4°C	
		After 1 hr.	After 3 hrs.	After 1 hr.	After 3 hrs.	After 20 hrs.	After 40 hrs.	After 20 hrs.	After 65 hrs.
Cocoa nut oil	8.43	28.83	42.66	18.55	32.05	4.07	5.40	—	—
Cacao butter	37.40	26 72	35.52	10.00	17.76	—	—	—	—
Lard	56.12	18 07	23 74	6.41	11.13	2.29	6 21	—	—
Oive oil	88.47	21.33	32 64	23.28	39.84	12.84	21.64	33.77	48.70
Soya bean oil	137.00	20.83	31.31	19.42	32.12	—	—	—	—
Sardine oil	175.94	22.02	30.13	13.85	19.83	11.93	27.80	—	—
Linseed oil	183.32	24.71	37.94	23.83	36.03	19.40	53.40	—	—
Perilla oil	187.03	26.66	37.61	22.74	35.42	26.73	51.30	49.53	66.13

Table 9. Relation between the Surface Tension of Emulsions and Temperature.

Temp.	Water	Emulsion I				Emulsion II			
		Olive oil		Perilla oil		Olive oil		Perilla oil	
	h	h	σ	h	σ	h	σ	h	σ
30°C	30.5	10.5	21.7	9.0	18.9	12.8	26.5	12.0	25.3
18	30.5	10.7	22.3	9.0	19.1	12.5	26.0	11.7	24.8
0	30.0	8.0	16.6	8.9	19.0	11.0	23.2	11.6	24.8
−4	—	0	—	8.8	19.0	—	—	—	—

h represent the hight in mm. of emulsion rising capillary of 0.5 mm diameter, and σ the surface tension.

Some Experiments on Fresh Tobacco Leaves.

(pp. 210~218)

By K. Ōike.

(Central Research Institute, Japanese Government Monopoly Bureau;
Received February 26, 1941.)

Vol. 17 April 1941 No. 4

Bulletin of the Agricultural Chemical Society of Japan.

ABSTRACTS
from
TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Über die Bestandteile der japanischen Mistel.
I. Isolierung von Arginin.
II. Untersuchungen über Harze.

(SS. 219～229)

Von Yataro OBATA.

(Biochemiches Institut der Landwirtschaftlichen Fakultät, Universität Tokio;
Eingegangen am 13. 3. 1941)

Functional Studies on Soils. (XV～XVI).

(pp. 230～234)

By MISU-Hideo.

(Agricultural Experiment Station, Government General of Tyosen;
Received January 11, 1941.)

Studies on the Chemical Sterilization and Preservation on Fishes and Shellfishes.

(pp. 235～246)

By Sogo TETSUMOTO.

(Government Institute for Infections Diseases, Tokyo Imper. Univ.;
Received Nov. 8, 1941.)

I performed this experiment to examin the effect of chemical sterilization and preservation on raw fishes and shellfishes.

Details of the study I will report on the next paper.

On Amino Acids in Saké.

(pp. 247～251)

By Yasuji TADA and Toraji TUKAHARA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received March 24, 1941)

The Effect of the Amount of Food Consumed in Animal Experimentation.

(pp. 252～254)

By Isa NAKAMURA.

(Division of Animal Nutrition, University of Illinois(1); Received for
Publication March 25, 1941.)

The amount of food consumed by experimental animals has profound influence upon the production and cure of anemia, the basal metabolism of growing rats, calcification of bones, production of polyneuritis on a thiamin deficient diet, etc. Hence it is imperative to control food intakes of experimental animals in a good experiment.

(1) On leave of absence from September 1, 1940 to August 31, 1941.

Biochemical Studies on Glutathione. Report XVI.

(The Glutathione Content in Organ Tissues in Starvation.)

(pp. 255～262)

By Masayoshi OGAWA.

(Department of Nutrition, College of Medicine, Nippon University;
Received March 12, 1941.)

In the present communication the author reported on the determination of the glutathione content (GSH, GS–SG) in various organ tissues such as liver, kidney, spleen, lung and heart.

For the experimen the employed several albino rats weighing about 200 gms which have been starved during 5, 10.8, or 14 days.

The results obtained are shown in the following table.

Glutathione content in organ tissues (mg %).

		Control	Starved for 5 days	Starved for 10.8 days	Starved for 14.0 days
Liver	Weight (g)	8.07	5.54	5.05	4.25
	GSH	254	186	219	190
	GS-SG	82	89	103	77
	Total	336	275	322	292

Kidney	Weight (g)	1.74	1.41	1.28	1.31
	GSH	200	202	194	178
	GS-SG	29	33	32	29
	Total	230	235	226	207
Spleen	Weight (g)	0.54	0.39	0.39	0.30
	GSH	184	181	190	169
	GS-SH	63	68	62	48
	Total	247	249	252	217
Lung	Weight (g)	1.55	1.49	1.37	1.09
	GSH	103	90	91	87
	GS-SH	30	22	10	11
	Total	133	112	101	98
Heart	Weight (g)	0.83	0.68	0.72	0.68
	GSH	109	101	105	101
	GS-SG	17	25	16	2
	Total	126	126	121	103

As shown in the above table the GSH content in the kidney, lung, heart and the GS-SG content in lung are gradualy decreased, whereas the GSH and GS-SG content in the liver, spleen and the GS-SG content in heart are at first somewhat increased at the initial-middle period of the starvation and then decreased.

The Utilization of the By-Products of Soy-beans.
(Part VI.)

On the Hydrolysis of Stachyose.

(pp. 263～268)

By Yosaburo Iwasa.

(Dept. of Food Chemistry, Osaka Municipal Hyg. Lab.;
Received February 26, 1941.)

Über den Mechanismus der Enzymwirkungen.

(SS. 269～281)

Von Yukihiko Nakamura und Kakomu Satow.

(Institut für Landwirtschaftliche Chemie, Landwirtschaftliche Fakultät der Kaiserlichen
Hokkaido Universität; Eingegangen am. 22. 2. 1941.)

Im Jahre 1927 hat Nakamura eine Gleichung der Enzymwirkungen abgeleitet, namlich

$$k = \frac{1}{t^{k'}} \cdot \frac{x}{a(a-x)} .$$

(Vol. 17,

aber die Bedeutung der Konstante k' wurde von ihm nicht erklart.

Die Verfasser haben die jetzigen Untersuchungen unternommen, um die Bedeutuug dieser Konstante k' zu erklären. Sie haben Diastase, Pepsin und Trypsin als Enzym und Stärke und Casein als Substrat gebraucht. Die Hydrolyse der Substrate wurden durch Veranderungen der Versuchstemperaturen, der Wasserstoffionenkonzentrationen der Lösungen, der Enzymmengen und der Substratmengen durchgefuhrt. Die Werte von k und k' wurden mittels der Methode der kleinsten Quadrate berechnet.

Es wird bemerkt, daß eine reziproke Beziehung zwischen k und k' vorhanden ist, d. h. wenn k größer ist, ist k' desto kleiner. Nach der Meinung der Verfasser ist k' eine Konstante, die eine Beziehung zur Inaktivierung des Enzymes hat. Die Große von k' muß zu der Große der Inaktivierung des Enzymes eine direkte Beziehung haben.

Influence of Monochromatic Lights on the Action of Enzymes. (Report XXXIV～XXXVI).

(pp. 282～290)

By Reitaro MURAKAMI.

(Agricultural College, Utunomiva; Received February 19, 1941)

A quartz mercury lamp was used to investigate the influence of the visible monochromatic lights on the action of the saccharase, amylase and proteinase in the yeast.

The enzyme solutions containing caeh substrate were irradiated througth the layer of copper sulphate solution and the monochromatic filters of red, green, blue and violet, each passing no ultra and infra-red rays. Colorless and black filters passing respectively all visible and no rays were also used for controls.

The preparation of the enzymes, the measurement of the enzyme action and the other treatments were the same as in the author's previous papers(1).

In this experiment, the actions of yeast saccharase, amylase and proteinase were promoted by the visible monochromatic lights. The effect of monochromatic lights on the actions of these enzymes was found to be more pronounced with the wave number as in the author's previous report(1).

(1) Bull. Agri. Chem. Soc. (Japan), **16**, 55～68, (1940).

On the Chemical Studies of the Bagass-pulp.

(pp. 291～294)

By Tetutarō TADOKORO and Keizō ITO.

(Hokkaido Imperial University; Received March 22, 1941.)

Studies on the Hydrolysis of Proteins at High Temperature and Pressure (I)

(pp. 295～299)

By Kenzo NAKAJIMA and Masami IKEDA.

(Reserach Institute of Honen Oil Co., Ltd.; Received March 18, 1941.)

The hydrolysis of soybean protein, casein and gelatine at high temperature and pressure was studied.

One hundred grams of soybean protein and 300 cc water were put into a stainless steel cup of 500 cc capacity and mixed well. The cup was then set in an autoclave. After the pressure had been raised up to a certain point by pumping air into the autoclave, the temperature was raised electrically up to a certain point. It took about one hour to raise the temperature up to 150°C from room temperature. After both temperature and pressure had been raised to the points determined upon conditions were maintaind in this state for a given time, at the end of which the heating was stopped. The autoclave was allowed to cool by itself. When the temperature of the sample had fallen to 95～100°, it was taken out from the autoclave. The amino nitrogen and ammonia were determined as given in Table I.

Table I. Amino and ammonia nitrogen of soybean protein hydrolysed at high temperature and pressure

Initial pressure (atm.)	Decomp. temp.	Pressure (atm.)	Time keeping temp. and press. (hrs.)	Soluble N (%)	Amino N (%)	Ammonia N (%)	Amino N + Ammonia N (%)
20	155° + 5°	38	4	75 58	10.65	13 22	23 87
35	160° ± 5°	62	5	82.09	11.32	20.85	32.17
50	140° ± 5°	76	4	79.23	10.49	20.33	30.82
50	185～195°/± 5°	100	4	—	17.44	30.44	47.84
65	100° ± 5°	85	4	38.37	9.11	8.03	17.14
70	170° ± 5°	120	4	74.46	14.11	23.24	37.35
85	170° ± 5°	150	4	74.13	13.21	26.17	39.38
100	170° ± 5°	185	4	70.75	20 88	30.63	51.51

From the hydrolyte obtained at 170° ± 5° and 110 atm., substances of albumose and peptone types were fractionated.

A colouring matter of melanine type was precipitated from the hydrolyte when the solution was acidified at pH 2.0. This colouring matter was very slightly soluble in 50% ethyl alcohol, and seemed to be insoluble in ethyl ether, carbon tetrachloride, toluol, xylol, amyl alcohol or carbon bisulfide. The elementary analysis gave the following data.

Table II. Elementary composition of the colouring matter

54.74 %	H	6.95 %	N	11.57 %	O	27.10 %

The colouring matter was completely hydrolysed with 20% HCl. The content of each type of nitrogen in the hydrolyte is given as follows:

Table III. Distribution of nitrogen in complete hydrolyte of the colouring matter

Ammonia nitrogen	10.89%	Amino nitrogen of ditto	19.77%
Humin nitrogen	50.18	Diamino acid nitrogen	7.08
Monoamino acid nitrogen	31.85	Amino nitrogen of ditto	2.03

From the filtrate of the colouring matter, proline (picrate), leucine and isoleucine (copper salt), phenyl alanine, oxyglutamic and glutamic acids, aspartic acid, arginine (silver salts) were obtained.

Casein, gelatine and soybean protein were compared as regards decomposition at 170° ± 5° under 65 atm. pressure. Amino nitrogen and ammonia were determined as given in Table IV.

Table IV. Ammonia and amino nitrogen in the hydrolytes of casein, gelatine and soybean protein

	Total hydrolyte (cc)	N in hydrolyte of 100 cc (%)	Amino nitrogen		Ammonia	
			(g)	(%)	(g)	(%)
Casein	335	3.3356	0.3453	10.35	0.8108	24.31
Gelatine	350	3.5708	0.5927	16.60	0 8238	23.07
Soybean protein	350	3.0731	0.4336	14.11	0.7213	23.27

The nitrogen content of each colouring matter precipitated at pH 2.0 from 100 g of each hydrolyte was determined as given in Table V.

Table V. Nitrogen content and yield of the colouring matter

	Colouring matter obtained from 100 g of hydrolyte (g)	N of colouring matter (%)
Casein	14.66	11.90
Gelatine	10.83	12.14
Soybean protein	10.91	11.57

The Fat Metabolism of the Mold Fungi. (1).

(The Fat formation by *Penicillium javanicum* cultured on the sugar cane juice.)

(pp. 300～306)

By Shinichi SUZUKI.

(Government Sugar Experiment Station, Tainan, Taiwan, Japan;
Received March 27, 1941.)

Vol. 17 May 1941 No. 5

Bulletin of the Agricultural Chemical Society of Japan.

ABSTRACTS

from

TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Studies on the Chemical Constituents of "Inekoji." Part VIII.

On the Margaric Acid Ester of Arabit (I).

(pp. 307~310)

By Teijiro YABUTA, Yusuke SUMIKI and Kinjiro TAMARI.

(Tokyo Imperial University; Received May 5, 1941.)

Abbau von Aminosäuren durch Asp. Oryzae.

IV Mitteilung.

(SS. 311~314)

Von Teijiro UYEMURA.

(Wissenschaftl. Laboratorium von Ch. Takeda & Co. ltd., Osaka;
Eingegangen am. 28. 4. 1941.)

On the Preparation of Methylethylketone and Isobutylaldehyde from 2,3-Butyleneglycol.

(pp. 315~320)

By Shinzaburo FUKUHASHI and Kisetsu ŌHARA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received April 14, 1941.)

Studies on the Root Forming Substances of Cuttings.

(pp. 321~335)

By Kinjiro TAMARI.

(Agr. Chem. Laboratory, Tokyo Imperial University; Received April 23, 1941.)

On the Fixation of Sericin of Raw Silk. (Part VI).

One Method of Denoting the Degrees of Fixation of Sericin.

(pp. 336~340)

By Masami OKU.

(From the Fibre Chemical Laboratory, Ueda Imperial College of Sericulture and Silk Industry; Received April 12, 1941.)

There have been proposed many methods of determining the fixation-degrees of sericin of raw silk but none of these reveal the truth.

The most popular method hitherto adopted is to determine the loss of weight of sericin-fixed sample when subjected to scouring with some dilute alkaline solutions. But this method cannot be said to be adequate because this does not take into account the following items;

1) Differences between the methods of fixation.
2) 〃 〃 the temperature of determining the boiling-off.
3) Differences between the sericin contents of the sample.
4) 〃 〃 the purposes utilised under many dyeing and finishing operations.

The author proposes here one method of denoting the adequate fixation degrees of raw silk, as follows.

When we take,

$A\%$ = Total loss of weight on scouring off the sericin-fixed sample,
$B\%$ = Solubility of the sericin-fixed sample,
$F\%$ = Fixation-degrees of sericin,

then

$$F\% = \frac{A-B}{A} \times 100.$$

Studies on the Chemical Sterilization and Preservation on Fishes and Shellfishs. II~III.

(pp. 341~360)

By Sogo TETSUMOTO.

(Government Institute for Infections Diseases, Tokyo Imper. Univ.; (Received Nev. 8, 1940.)

On the Oxidizing Enzymes in Tea Leaf. I.

(pp. 361~369)

By Hideiti TORII.

(Imperial Tea Experiment Station; Received March 19, 1941.)

1. The author describes the method of estimating peroxidase and catechin oxidase in tea leaf.

2. The properties of these enzymes, such as opt. pH, reaction temperature, thermostability and influence of light are reported.

3. The enzyme content of green leaf under some conditions and its variations in tea manufacture are studied.

On the Fixation of Silk-Sericin with Formaldehyde.

Part 2. The Adsorption of Formaldehyde on Various Kinds of Sericin.

(pp. 370～376)

By Toshio NAKAHAMA and Ikuzo SAKAGUCHI.

(Kanebo Yamashina Institute; Received May 15, 1941.)

(1) It was observed that Freundlich's adsorption isotherm could always apply to the adsorption phenomena of formaldehyde on various kinds of sericin: the ordinary sericin preparation, sericin A and B.

(2) When the dilute formaldehyde solutions lower than 3% were tested, a larger amount of formaldehyde was adsorbed on sericin B compared with sericin A, while sericin A revealed more powerful adsorption with the concentrated formaldehyde solutions higher than 4%.

Functional Studies on Soil. (XVII～XIX).

(pp. 377～382)

By Hideo MISU.

(Agricultural Experiment Station, Government General of Tyosen; Received April 12, 1941.)

Functional Studies on Soil. (XX～XXII).

(pp. 383～388)

By Hideo MISU.

(Agricultural Experiment Station, Government General of Tyosen; Received April 12, 1941.)

On the Denaturation of Sericin. (Part 4.)

Some relation of denaturation of α_{38}-sericin with α_{44}-sericin.

(pp. 389～393)

By Zirô HIROSE.

(Sericultural Research Laboratory of Gunze Raw Silk Mfg. Co. Ltd;
Received March 26, 1941.)

INTRODUCTION.

In the previous paper(1), I have reported on some relation of denaturation of

α_{38}–sericin with α_{44}–sericin stoichiochemically, and stated that the stoichiometric properties of denatured product of α_{38}–sericin, or α_1–sericin, are more similar to those of α_{44}–sericin than to the original α_{38}–sericin.

In this paper I reported on the difference of distribution of nitrogen between α_{48}–, and $\alpha_{4.8}$–sericin, and also on the sugar, amino sugar, and tryptophane contents of α_{44}–, α_{48}–, α_1–, α_2–, and $\alpha_{3.8}$–sericin and described some differences in the chemical structures among these sericins.

EXPERIMENTAL.

1. The difference of distribution of nitrogen between α_{48}–, and α_{38}– sericin.

a) Isoelectric point of α_{48}– sericin obtained from the cocoon flock by extracting with boiling water for 10 minutes.

10 gs. of cocoon flock, being carefully freed from impurities by washing with distilled water, was extracted by boiling for 10 minutes in 3 *l* of distilled water, and the experiment was carried out in the same way as described in the previous paper(2).

(Quantity of N is expressed in mg/200 cc)

Total Nitrogen	Kind of Sericin / pH	4.6	4.8	5.0	5.2	5.4
16.03	α-sericin N.	2.03	3.08 (max)	2.45	2.38	1.05
	β-sericin N	14.00	12.95	13.58	13.65	14.98
	β/α	—	420.5	—	—	—

Isoelectric point of α-sericin is about 4.8 in this case.

b) Preparation and isolation of α_{48}–sericin from cocoon flock.

50 gs of cocoon flock, being carefully freed from impurities was extracted by boiling for 10 minutes in 10 *l* of distilled water and obtained sericin sol. To this sericin sol, added acetate mixture of pH 4.8 (0.02), and precipitate thus formed was brought to the powdered state by means of alcohol and ether.

Yield……1.72 g N %……17.47%

c) The difference in distribution of nitrogen between α_{48}–sericin.

Determinations of N–distribution of sericins were carried out by van Slyke's method, after the hydrolysis of sericin with 20% HCl by boiling for 20 hours under the reflex condenser.

Kind of Sericin	Amide-N	Humine-N	Monoamino acid-N	Diaminoacid-N	Sum.
α_{48}-sericin	9.08	1.27	65.28	23.29	98.92
α_{38}-sericin	10.32	1.08	72.40	18.47	101.27

2. Sugar content of α_{44}–, α_{42}–, α_1–, and α_{38}–sericin.

The method of Tillmans(3) was used for the determination of carbohydrate of sericin. Experimental result was as follows:—

Kind of Sericin	Sugar (as glucose)		Kind of Sericin	Sugar (as gluc se)	
	Sugar per 100 mg of sericin (mg)	Sugar per 100 mg of sericin N		Sugar per 100 mg of sericin (mg)	Sugar per 00 mg of sericin N
α_{44}-sericin	1.13	6.54	α_1-sericin	2.13	12.43
α_{42}-sericin	1.82	10.69	α_{38}-sericin	1.07	6 49

3. Amino sugar contents of α_{44}–, α_{42}–, α_1–, and α_{38}–sericin. The method of Nillson(4) was used for the determination of amino sugar of sericin. Experimental result was as follows:—

Kind of Sericin	Amino sugar (as glucosamine)		Kind of Sericin	Amino sugar (as glucosamine)	
	Amino sugar per 100 mg of sericin (mg)	Sugar per 100 mg of sericin N		Amino sugar per 100 mg of sericin (mg)	Sugar per 100 mg of sericin N
α_{44}-sericin	1.41	8.16	α_1-sericin	2.02	11.79
$\alpha_{4.2}$-sericin	1.97	11.40	$\alpha_{3.8}$-sericin	1.13	6.86

4. Tryptophane contents of α_{44}–, α_1–, α_{83}–, and α_2–sericin*. The modified method of Tomiyama(5) for the colorimetric determination of tryptophane contents of sericin was used. Experimental result was as follows:—

Kind of Sericin	Tryptophane contents (%)
α_{44}-sericin	0.81
α_{42}-sericin	0.68
α_1-sericin	0.89
α_{88}-sericin	0.41
α_2-sericin *	0.31

* Note on α_2-sericin.

α_2-sericin was obtained as precipitate from the filtrate of α_1-sericin(2), adding alcohol until the alcohol concentration reached 50 %. So this fraction is decomposition product of α_{38}-sericin.

DISCUSSION.

As to the difference of physico-chemical properties and the chemical compositions among α_{44}–, $\alpha_{4.4}$–, α_{42}–, and α_{38}–sericin, we have already reparted.(1) The difference seems to have some relation to "component system theory of protein" as was already reported by Dr. Kondo and Dr. Sörensen. But here, one fact should be emphasized, that chemical composition and stoichiometric properties of α_{44}–sericin are more similar to α_1–sericin than to α_{38}–sericin.

Recently, Rutherford and Harries(6) studied the existence of fractions of the sericin in raw silk, and concluded that sericin in raw silk does not exist as a mixture of fractions. But they did not take into account the fact that sericin dissolves during the process of raw silk manufacturing. This dissolved sericin is rich in β–sericin(3), while, on the contrary, according to their results, the very low yield of β–sericin was obtained by the 5 minutes autoclave treatment. Therefore, we can not agree with their view in this respect.

SUMMARY.

1. In the nitrogen distribution, diamino acid-N contents of $\alpha_{4.8}$–sericin is greater than that of α_{88}–sericin.

2. Chemical composition of $\alpha_{4.4}$–, and $\alpha_{4\,2}$–sericin is more similar to α_1– than to $\alpha_{3\,8}$–sericin.

a $\alpha_{4\,2}$–, and α_1–sericin have more sugars and amino sugars than $\alpha_{3\,8}$–sericin.

b) $\alpha_{4\,4}$–, α_1–, and $\alpha_{4\,2}$–sericin have more tryptophane than $\alpha_{3.8}$– sericin, and $\alpha_{4\,4}$–, and α_1–sericin have more tryptophane than $\alpha_{4\,2}$–sericin.

Bibliography.

(1) Z. Hirose: Bulletin of Agri. Chem. Soc. Japan. **16**, 195 (1940).
(2) Z. Hirose: ibid., **16**, 194 (1940).
(3) Tillmans: Biochem. Z. **215**, 36 (1329).
(4) Nillson: Biochem. Z. **285**, 386 (1936).
(5) Tomiyama: Bulletin of Agri. Chem. Soc. Japan. **11**, 194~198 (1935).
(6) Rutherford and Harries: Amer. Dyestuff Rept. **29**, 9 (1940).

The Colloidal Clay in Solonchak and Solenetz Soils in Manchuria.

(pp. 394~395)

By KAWASHIMA and M. NAGATA.

(Agr. Chem. Laboratory, Kyushu Imp. University; Received April 24, 1941.)

The colloidal clay below 1 μ in particle size was separated by sedimentation and analized by the fusion method.

These colloids are characterized by high SiO_2/Al_2O_3 and SiO_2/R_2O_3 ratios, the former being from 4.15 to 4.50, and the latter from 3.11 to 3.30. The base-exchange capacity determined by the NH_4-acetate method varied from 40.10 to 64.35 m.e. The higher capacity is due to some mingled humic substances.

Studies on the Value of Chemicals as Manure for *Juncus effusus* L. var. *decipiens Buch.* III.

On the Value of Some Compound Fertilizers.

(pp. 396~403)

By H. SUTOH.

(The Simane Prefectural School of Agriculture and Forestry at Masuda, Simane, Japan; Received May 6, 1941.)

In this paper the result of the investigation into the relative value of some compound fertilizers will be reported.

The compound fertilizers used in the investigation were 8 kinds, namely, Mizuho-, Mikuni-, Kozuti-, Tukasa-, Tokiwa-, Ryûsô-kwaseihiryô, Sumitomo-kwaseirin'ankarihiryô, and Dainippon-rinsankarihiryô-5-gô. Several lots of these fertilizers as well as those of controls (mixed ammonium sulphate, sodium biphosphate and potassium sulphate) besides some of no-manure were set up.

Table I. Compound fertilizers used.

Constituents. / Compound fertilizers.	N_2		P_2O_5		K_2O		Notes
	Total	Ammoniac	Total	Water soluble	Total	Water soluble	
Mizuho.	8.0 %	8.0 %	10.0 %	7.0 %	5.0 %	5.0 %	gray; granular. (a little hygroscopic)
Mikuni.	10.0	9.0	10.0	8.0	10.0	10.0	dark gray.
Kozuti.	5.0	4.0	10.0	8.0	5.0	5.0	gray; fine granule.
Tukasa.	6.0	6.0	10.0	8.0	3.0	3.0	grayish white; coarse powder; external appearance like Ca-superphosphate.
Tokiwa.	5.0		12.0		3.0		gray; granular.
Ryûsô.	5.0	5.0	12.5	10.0			gray; coarse powder.
Sumitomo-kwasei-rin'ankari-hiryô.	10.0	10.0	5.0	4.5	5.0	5.0	gray; granular.
Dainippon-rinsan-kairihiryô-5-gô.			15.0	13.0	5.0	5.0	gray; powder; external appearance like Ca-superphosphate.

The condition of growth, yield as well as the quality of the rush were investivated.

The rushes in the lots of the compound fertilizers were all observed to have grown healthier and better than those in the control lots.

The comparative yields and other data are presented in the following table.

Table II. Experimental results.

Lots. / Items.	No-Manuse.	Mizuho.	Mikuni.	Kozuti.	Tukasa.	Tokiwa.	Ryûsô.	Sumitomo-kwasei-rin'ankari.	Dainippon-rinsankari-5-gô.	Control.
Air-dried stems (weight) (total)	4	123	115	125	126	113	118	127	123	100
(over 45 cm)	0	127	128	139	140	126	125	143	139	100
(over 75 cm)	0	264	254	275	277	256	202	283	289	100
Number of stems (over 45 cm)	0	105	111	125	117	107	116	126	112	100
(over 75 cm)	0	236	236	268	239	232	183	265	254	100
(total)	12	95	95	98	97	88	93	97	86	100
Total weight.	5	120	111	116	115	107	111	121	116	100
Tillering (multiples compared to number of young plants transplanted)	3.4	26.3	26.5	27.2	26.9	24.4	25.8	27.0	24.0	27.8
(over 45 cm)	0	13.3	14.0	15.7	14.7	13.5	14.6	15.9	14.2	12.6
T/R	0.99	2.35	2.50	2.82	3.11	2.64	2.65	2.59	2.62	2.20

The comparative yield of air-dried stems was 127 in the lot of Sumitomo-kwasei-rin'ankari-hiryô, 126 in Tukasa-lot, 125 in Kozuti-lot, 123 in Mizuho-lot, 123 in Dainippon-rinsankari-hiryô-5-gô-lot, 118 in Ryûso-lot, 115 in Mikuni-lot, 113 in Tokiwa-lot, 100 in control lot (mixed chemicals) and 4 in no-manure lot. The comparative yield in long stems (over 75 cm) was 289 in the lot of Dainippon-rinsankari-hiryô-5-gô, 283 in Sumitomo-kwasei-rin'ankarihiryô-lot, 277 in Tukasa-lot, 275 in Kozuti-lot, 264 in Mizuho-lot, 256 in Tokiwa-lot, 254 in Mikuni-lot, 202 in Ryûsô-lot and 100 in control lot. Further investigation, however, will be necessary to definitely determine the relative fertilizing value of these fertilizers so as to assign each of them a definite position according to its value as a manure for the rush.

The multiplication of tillers were found to be three times in no manure-lots and as high as 28 times the original number in the case of control lot. The increase in number of stems in the compound fertilizer lots ranged from about 24 to about 27 times the number at the start. In the stems grown over 45 cm in length the increase in number of tillers ranged from about 13 times in Mizuho-lots to about 16 times the original number in Sumitomo-kwasei-rin'ankari-lots.

So far as the present investigation goes, Sumitomo-kwasei-rin'ankari-hiryo seems to be much more effective for the growth of the rush than other compound fertilizers, Dainippon-rinsankari-hiryo-5-go being superior as the manure of phosphoric acid and potash manure for the cultivation of the rush.

The compound fertilizers above mentioned all have the so-called peculiar properties, and it is possible for this reason to regard them as adequate manures for the cultivation of the rush plant.

On the Chemical Studies of the Bagass-pulp. (2~3).

(pp. 404~410)

By Tetutarô Tadokoro and Keizô Ito.

(Hokkaido Imperial University; Received April 1, 1941.)

オスカル　ロイブ先生

1844年獨逸レドヴヰツツ市に生れ1941年1月26日逝去せらる

(昭和10年藪田博士ベルリンにて撮影)

ドクトル　オスカル　ロイブ先生傳

昭和16年1月26日，ベルリン大學名譽教授，獨逸化學者聯合會名譽會員，元東京帝國大學農科大學農藝化學教師，日本化學會及び農學會名譽會員，勳三等ドクトル，オスカル，ロイブ(Dr. Oscar Loew)先生 98 歲の高齡を以て逝く，痛惜の至りに堪へず。先生は 1844 年獨逸國北ババリヤのレドヴヰッツ市 (Markt Redwitz) に生れ父は藥劑師なり。初め同市にある羅甸學校を卒業して，ヴュンジーデル (Wunsiedel) 技藝學校に入り，卒業後は父の業を助け製藥室內に於て研究に從事し，父に勸めて研究室を完備せしめたり。尋いでバイロイト (Bayreuth) に於ける最初の藥劑師試驗に合格したるが專ら化學の研究に意を傾けたり。父は嘗て數年間ギーセン (Giessen) に於けるリービヒ (Liebig) 先生の化學實驗室に於て學び，同先生教室より刊行せる數多の重要なる報文を所持せるを以て，ロイブ先生は常に之れを愛讀して動植物化學に關し至大の趣味を有するに至りたり。當時リービヒ先生はミュンヘン (München) 大學教授なりしが，ロイブ先生は親しくリービヒ先生を訪問して先生の著書中に於ける化學事項に就て特別の趣味を有することを告げ，乞ふて其化學實驗室に入り 1 年間教を受けたる後，ライプチヒ (Leipzig) に趣きコルベ (Kolbe) 氏の化學實驗室及びルードヴヰヒ (Ludwig) 氏の生理學研究室に於て研究に從事し，又動植物生理學を學び 1866 年ドクトル・フヰロソフヒーの學位を得たり。

1867 年北米合衆國に赴きニューヨルク市立醫學專門學校に於て化學助手として四年を經過し，1872 年テキサス (Texas) に於ける同國政府の學術探險隊に加はり，1873 年より 1875 年まで地理及び地質調査員となり，ニュー，メキシコ (New Mexico), アリゾナ (Arizona), 南カリホルニヤ (South California), ネバダ (Nevada), ユタ (Utha) 及びコロラド (Colorado) 等西經百度以西の地方を跋渉して農業狀態，土性，鑛山等に就て調査し，又植物，岩石化石等を蒐集して，ワシントン市に持歸り化學的分析を行ひたり．

前記の調査報告を終りて後獨逸國に歸りミュンヘン大學教授ネーゲリ(Nacgeli)氏の植物學教室に入り，菌類，藻類等の榮養に就て研究を行ひ，植物體中蛋白質の生成に關して知得したるところ少からず，活性蛋白質分子內に於ける原子族が不安定狀態 (Labile Condition) に存在するとの學說は實に此教室に於ける研究に胚胎すといふべし。メチルアルコールを單一の有機物として加へたる培養液中に細菌類の發育する事を實驗して，アルブミン (Albumin) 及びヌクレオプロテイン(Nucleoprotein) を主成分とする生活原形質の生成に關して特別の考說を得，化學的縮合作用はアルブミン合成の根底にして，生活原形質の驚くべき化學的活力はヌクレオプロテインの分子中にアミド族及アルデヒド族の如きものが存在し爲に不安定狀態をなすに由ると說明し，生活細胞の死するは斯る不安定の原子族が安定のものに變化するにありと唱へ，其後此說を支持する事實を補足せんと欲して數多の植物の部分に就て，顯微鏡的檢査を行ひたるが，遂に多くの植物の細胞液中に蛋白質物より成る球狀物質の存在を認め，之れをプロテオソム (Proteosom) と命名しカフエイン其他の生活細胞に作用する凡ての物質は此の球狀物を不正形の溷濁物に變化し，此物質が生活原形質を生成するに用ゐらるゝ不安定の貯藏アルブミンなることを說きたり。尙又是等の研究をなす間にフォルムアルデヒドの生成に就て簡便なる新法を發見し，又彼の有名なるフヰッシャー氏の糖類合成研究に先ちてフォルマリン液に生石灰を加へて加熱し，縮合作用を起さしめて一種の砂糖を合成し得ることを發見し，糖類合成化學上に寄與するところ頗る大なり．

1892 年東京帝國大學の聘に應じて來朝し，農科大學農藝化學科に教鞭を執られ熱心懇切に講義及び實驗指導に從事し，農藝化學科に醱酵化學及び生物化學に關する新知識を注入せられたり。門下生として矢部規矩次，奧村順四郎，矢木久太郎，大工原銀太郎，山下脇人，吉村淸尙，鈴木梅太郎，鈴木重禮，高橋偵造，片山外美雄氏等の諸博士あり。余も亦驥尾に附して先生に親しく指導を受け

たり。就中鈴木梅太郎氏は先生の蛋白質，殊に生活原形質に關する學說に感奮して蛋白質に關する研究を初め遂に今日の成功を見るに至りたるは特筆すべきことなり。然るに先生は在任すること四年にしてリユマチス病に冒され，職を辭して急遽歸國せられたるが幾くもなくして北米合衆國農務省の聘に應じ，ポルトリコ (Port Rico) 及ワシントン市に於て專ら煙草製造中に於ける化學的變化の研究に從事し，二種の報文を公にせられたるか新鮮なる煙草葉中に過酸化水素を分解する新酵素の存在することを發見し，カタラーゼ(Katalase)と命名し後此酵素は動植物體の諸部分に分布することを認めたり。斯の如くカタラーゼの廣く生物體中に存在することは過酸化水素が細胞呼吸作用に於ける副生物にして其儘にては生物體に有毒作用を爲すべきを以て，此酵素に依りて分解せらるゝことが自然に必要なるべしと說き，カタラーゼに就て一論文を公にせられたり。カタラーゼは其後生物化學，農藝化學，醫化學等に關する多くの學者に依りて研究せられ原理及應用方面に於て頗る重要なるものとなりたり。1899年の末に至り再ひ東京帝國大學より招聘せられ喜んで米國を辭して來朝し，七年間東京駒場に止りて學生の薫陶に從事せられたり。余は幸ひにして先生の助手に任命せられ，終始同室に於いて指導を受け研究に從事し得るの光榮を得たり。此間に於て行はれたる主なる研究は諸種化合物の植物生長に及ぼす刺戟作用，石灰率說を確むべき諸種研究，酸化酵素類に關する研究等にして其他動植物化學に關するもの頗る多し。1906年歸國せられたるが，日本政府は先生を勳二等に叙し瑞寶章を贈りて其功に報いられたり。

ミユンヘンに歸りて後，ミユンヘン大學植物學教室內ゲーベル (Gaebel) 教授講義室に於て植物化學の講義をなし，又親友エムメリヒ (Emmerlich) 教授の研究室に於て研究に從事せられたるが，1914年ミユンヘン大學のオノラリー・フロノエツソル (Honorary Professor) となり，自ら一研究室を得てエムメリヒ教授と共に，バチルス・ピオチアニユス (Bacillus pyocyaneus) 菌に依りて生ぜらるゝ新酵素ピオチアナーゼ (Pyocyanase) に就て研究し，或種の細菌を培養したる液は長時日を經れは，細菌體は溶解して透明液となるは斯る酵素の作用に依るべき事を說明し，此酵素を應用して或種の疾病を治癒せんと企てたるか斯かる研究は既に本邦在任當時より古在教授と共同して初められたるものなり。

先生は曩きにアオミドロ(Spirogyra)を用ゐて實驗し葉綠體及細胞核中に石灰蛋白質(Kalkprotein)の存在すべきことを說き從來不明なりし植物體中に於けるカルシウムの生理的作用に就いて一新說を出し石灰率說を提唱し，カルシウムか細胞核の成分として重要なる作用を爲すが故に動植物體中細胞核の多き部分はカルシウムを多量に要し腦髓，神經，腺等の如き細胞核大なる部分は石灰含量も多くカルシウム缺乏すれは細胞核は生活力を失ひ，延て細胞全體が死するに至ることを說き，家兎，モルモツト，白鼠等を用ひて研究したる結果，食物中カルシウム鹽類を加ふるときは著しく生產率を增加し得ることを明かにし，又從來不治とせられたる一種の痙攣病をカルシウム劑に依りて治療し得ることに成功したり。尙ほカルシウムの生理的作用に就て研究して，乳酸石灰を服用すれば血液のアルカリ反應を著しく增加し得る結論に達し，此の目的に對してはカルシウム及びナトリウムの乳酸複鹽を推奬してカルサン (Kalzan) と名づけて新藥を製造して發賣せしめカルシウムの生理的作用に就て數多の論文を公にし九十二歲の時長生と健康 (Hohes Alters und Gesundheit) と題する論文を公にして生理上カルシウムの必要を說かれたり。

1930年リービヒ銀牌を贈られリービヒ門下生中唯一の生殘者として大に尊敬せられたるが，百歲に二歲を餘して遂に逝去せられたるは誠に痛惜感慨に堪へざるところなり。

麻生慶次郎氏識す

Vol. 17 June 1941 No. 6

Bulletin of the Agricultural Chemical Society of Japan.

TRANSACTIONS

Einige Versuche über die Bestimmung der reduzierenden Zucker im Zuckerrohr und im Handelszucker.

Von T. Yoshida, T. Fukura, T. Tanaka
und K. Yamafuji.

(Aus dem Institut für Zuckerforschung in Tainan)

Eingegangen am 24. 4. 1941

In einer Reihe von Arbeiten (1 bis 7) haben wir einige Methoden zur Zuckerbestimmung in Gegenwart von Saccharose berichtet. Um den Zuckergehalt des Zuckerrohrsaftes oder des Handelszuckers genau zu bestimmen, ist es notig, noch einige weitere Versuche zur Erganzung auszufuhren.

1. Zur Zuckerbestimmung nach *Bertrand*.

Bei der Bestimmung der Mono- oder Disaccharide wird in den meisten Fallen die Methode von *Bertrand* verwendet. Diese Methode ist aber bei der Zuckerbestimmung in Gegenwart einer grossen Menge Rohrzuckers unbrauchbar. Wir haben in dieser Arbeit zunachst den Einfluss der Saccharose auf die Zuckerbestimmung nach *Bertrand* untersucht. Auf Grund einer Reihe von Versuchen geben wir fur die Berechnung der Zuckermengen aus dem gefundenen Kupferwert die folgende Ubersicht an (Tabelle I).

Tabelle I.

Kupfer in mg	Rohrzucker in mg				
	0	0,2	0,4	1.0	2,0
	Invertzucker in mg				
2	1,0	—	—	—	—
4	2,0	—	—	—	—
6	3,0	—	—	—	
8	4,0	—	—	—	—
10	5,9	0,0	—	—	
12	5,9	1,0	—	—	—
14	6,9	2,0	—		—

16	7,9	3,1	—	—	—
18	8,9	4,2	—	—	—
20	9,9	5,3	—	—	—
22	10,8	6,3	1,1	—	—
24	11,8	7,3	2,3	—	—
26	12,8	8,4	3,5	—	—
28	13,8	9,5	4,7	—	—
30	14,8	10,6	5,8	—	—
32	15,8	11,7	6,9	—	—
34	16,8	12,8	8,0	—	—
36	17,8	14,0	9,0	—	—
38	18,8	15,2	10,2	—	—
40	19,8	16,4	11,3	—	—
42	20,8	17,5	12,3	—	—
44	21,8	18,6	13,4	0,8	—
46	22,9	19,7	14,5	2,1	—
48	24,0	20,8	15,6	3,4	—
50	25,1	21,9	16,7	4,7	—
52	26,1	23,0	17,7	6,0	—
54	27,2	24,1	18,8	7,3	—
56	28,3	25,2	19,9	8,6	—
58	29,4	26,3	21,0	9,9	—
60	30,5	27,5	22,1	11,2	—
62	31,5	28,5	23,2	12,5	—
64	32,5	29,6	24,3	13,9	—
66	33,6	30,7	25,4	15,3	—
68	34,7	31,8	26,6	16,7	0,3
70	35,8	36,2	27,8	18,1	1,8
72	36,9	34,0	29,0	19,4	3,3
74	38,0	35,1	30,2	20,7	4,8
76	39,1	36,2	31,4	22,0	6,3
78	40,2	37,3	32,6	23,3	7,8
80	41,3	38,4	33,9	24,7	9,4
82	42,4	39,5	35,2	25,9	10,8
84	43,5	40,6	36,5	27,1	12,2
86	44,6	41,8	37,8	28,3	13,6
88	45,8	43,0	39,1	29,4	15,0
90	47,0	44,2	40,5	30,7	16,5
92	48,1	45,4	41,8	31,9	17,8
94	49,2	46,6	43,1	33,1	19,1
96	50,3	47,8	44,4	34,4	20,5
98	51,5	49,0	45,7	35,7	21,9
100	52,7	50,2	47,1	37,0	23,3
102	—	—	—	38,4	24,6
104	—	—	—	39,8	25,9
106	—	—	—	41,2	27,2
108	—	—	—	42,6	28,5

110	44,1	29,2
112	45,5	31,2
114	46,9	32,6
116	48,3	34,1
118	49,7	35,5
120	51,2	37,1
122	—	39,0
124	—	40,9
126	—	42,9
128	—	44,9
130	—	46,9
132	—	48,9
134	—	50,9

2. Zur Reinigung der zuckerhaltigen Losung.

Die Zuckerlosung muss vor der Zuckerbestimmung gereinigt werden. Dazu wird gewöhnlich "dry lead" benutzt. Bei der Verwendung einer zu grossen Menge von "dry lead" wird die Lösung trube. Es ist daher bei der Reinigung der zuckerhaltigen Lösung notwendig, die geeignete Menge des Reagens hinzuzufügen. Die Verschiedenheit der zuzusetzenden Reagensmenge nach dem Reinheitsgrad der Lösung ist aus Tabelle II ersichtlich.

Tabelle II.

	Farbe des Zukkers in Nummer von "Dutch standard"	Geeignete Menge von "dry lead" in g pro 1 cc 26%iger Zuckerlosung		Farbe des Zukkers in Nummer von "Dutch standard"	Geeignete Menge von "dry lead" in g pro 1 cc 26%iger Zuckerlosung
Handelszucker 1	D. S. 15	0,10~0,30	Handelszucker 5	D. S. 21	0,05~0,10
" 2	D. S. 17	0,10~0,30	" 6	—	0,05~0,07
" 3	D. S. 18	0,10~0,30	" 7	—	0,05~0,07
" 4	D. S. 20	0,05~0,10	" 8	—	0,05~1.00

3. Zur Zuckerbestimmung nach *Luff*.

Wir konnten feststellen, dass nach dieser Methode der Reduktionswert fur Glucose demjenigen fur Fructose gleich ist (Tabelle III).

Tabelle III.

Zugesetzte Zuckermenge in mg	Glucose		Fructose	
	Verbrauchtes 0,1 n Thiosulfat in cc	Gefundene Zuckermenge in mg	Verbrauchtes 0,1 n Thiosulfat in cc	Gefundene Zuckermenge in mg
10	3,04	9,7	3,14	10,0
20	6,27	19,4	6,37	19,7
30	9,60	29,7	9,70	30,0
40	12,84	39,8	12,84	39,8

Nach der *Luff*schen Methode wird die Mischung auf einem Asbestdrahtnetz in 3 Minuten zum Sieden erhitzt und wahrend 5 Minuten im Sieden erhalten Um zu starke Erhitzung zu vermeiden, haben wir die Mischung im siedenden Wasserbad erhitzt. Dabei wurde gefunden, dass die Reaktion innerhalb 10 bis 20 Minuten beendingt (Tabelle IV) ist.

Tabelle IV.

Erhitzungsdauer in Min.	Thiosulfatverbrauch in cc		Erhitzungsdauer in Min.	Thiosulfatverbrauch in cc	
	Glucose	Fructose		Glucose	Fructose
5	3,97	5,73	20	6,35	6,30
10	6,03	6,30	30	6,35	6,35
15	6,20	6,28			

Unter den Bedingungen dieser Methode wird auch Rohrzucker einigermassen zersetzt. Wie aus Tabelle V ersichtlich ist, ist aber bei der Saccharosemenge unter 5 g die Korrektion fur diesen Zucker entbehrlich.

Tabelle V.

Sacharosemenge in g	5,00	2,50	1,25	0,05
Thiosulfatverbrauch in cc	0,30	0,15	0,05	0,00

4. Zur Zuckerbestimmung nach *Ofner*.

Aus den Versuchen in Tabelle VI geht hervor, dass bei Glucose, Fructose und Invertzucker 1 cc 0,0323 n Jod immer 1 mg Zucker entspricht.

Tabelle VI.

Zugesetzter Zucker in mg	Verbrauchtes 0,0322 n Jod in cc		
	Glucose	Fructose	Invertzucker
2,5	2,40	2,45	2,45
5,0	4,75	4,95	4,85
7,5	7,40	7,55	7,50
10,5	9,70	10,25	9,95
12,5	12,10	12,70	12,40

Wir haben dann zur zuckerhaltigen Losung das *Luff*sche Reagens zugesetzt und die Mischung in einem Wasserbad anstatt auf einem Drahtnetz erhitzt (Tabelle VII).

Tabelle VII.

Erhitzungsdauer in Min.	Verbrauchtes 0,0323 n Jod in cc		Erhitzungsdauer in Min	Verbrauchtes 0,0323 n Jod in cc	
	Glucose	Fructose		Glucose	Fructose
5	1,40	6,30	30	10,40	10,70
10	5,00	10,00	60	10,40	10,70
20	9,70	10,50			

Wenn die Mischung 30 Minuten im siedenden Wasserbad erhitzt wird, so entspricht, wie aus Tabelle VIII ersichtlich, 1 cc 0,0323 n Jod 0,96 mg Zucker.

Tabelle VIII.

Zugesetzter Zucker in mg	1 cc 0,0323 n Jod entspricht		
	mg Glucose	mg Fructose	mg Invertzucker
1,0	1,00	1,00	1,00
2,5	0,96	0,96	0,96
5,0	0,94	0,94	0,94
7,5	0,94	0,93	0,93
10,0	0,96	0,94	0,95
12,5	0,98	0,95	0,97
Mittel	0,97	0,95	0,96

Enthalt die zu untersuchende Losung neben irgendeinem reduzierenden Zucker noch eine grosse Menge Saccharose, so muss man vor des Berechnung des Zuckergehaltes den Jodverbrauch durch Rohrzucker von der verbrauchten Menge Jod abziehen (Tabelle IX).

Tabelle IX.

Saccharose in g	5,0	2,5	1,0	0,5
Jodverbrauch in cc	1,00	0,50	0,20	0,10

Schrifttum.

(1) T. Yoshida, Y. Iwata u. K. Yamafuji: Enzymol., 2, 342 (1938).
(2) K. Yamafuji u. T. Yoshida: Enzymol., 6, 229 (1939).
(3) K. Yamafuji u. T. Yoshida: Biochem. Zs., **301**, 61 (1939).
(4) T. Yoshida, T. Tanabe u. K. Yamafuji: Diese Zs., **15**, 49 (1939).
(5) T. Yoshida u. K. Yamafuji: Enzymol., im Druck.
(6) T. Yoshida u. K. Yamafuji; Enzymol., im Druck.
(7) K. Yamafuji, T. Yoshida u. T. Fukura: Biochem. Zs., im Druck

ABSTRACTS
from
TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Separation and Identification of Fatty Acids. Part 3.

A New Method of the Preparation of Pure Oleic Acid and Elaidic Acid by Means of the Hydroxamic Acid Method.

(pp. 411~413)

By Y. INOUYE and H. YUKAWA.

(Biochemical Laboratory, Department of Agriculture, Kyoto Imperial University;
Received May 27, 1941.)

In previous papers we proposed a convenient method for the separation and identification of saturated and unsaturated fatty acids, rendering to hydroxamic acid derivatives in crystalline forms which had higher melting points than free acids or any other previously proposed derivatives, e. g., *p*-bromophenacyl ester.

In the present work we isolated oleohydroxamic acid (m. p. 61°) in good yield directly from olive oil by the reaction of hydroxylamine hydrochloride in the presence of sodium ethylate, the details of the method being just the same as described in the previous papers for ethyl ester. And then we confirmed that free acids could be quantitatively recovered through refluxing the hydroxamic acid with dilute alcoholic solution of sulphuric acid. Accordingly, we can recommend this method as a preparation method of pure oleic acid from natural oil, without using the ordinary process of bromination and debromination, the distillation under reduced pressure, or salt-solubility method.

The authors prepared also pure elaidohydroxamic acid (m. p. 91) from elaidic acid, which was obtained by elaidinization of the above oleic acid, and recovered pure elaidic acid again by the same process. The elaidohydroxamic acid is soluble in alcohol, acetone, ether, etc., but insoluble in petroleum ether. And of course it gives characteristic reactions with ferric chloride and copper acetate which are generally those of hydroxamic acids.

Zinc Dust Distillation of some Benzene Compounds.

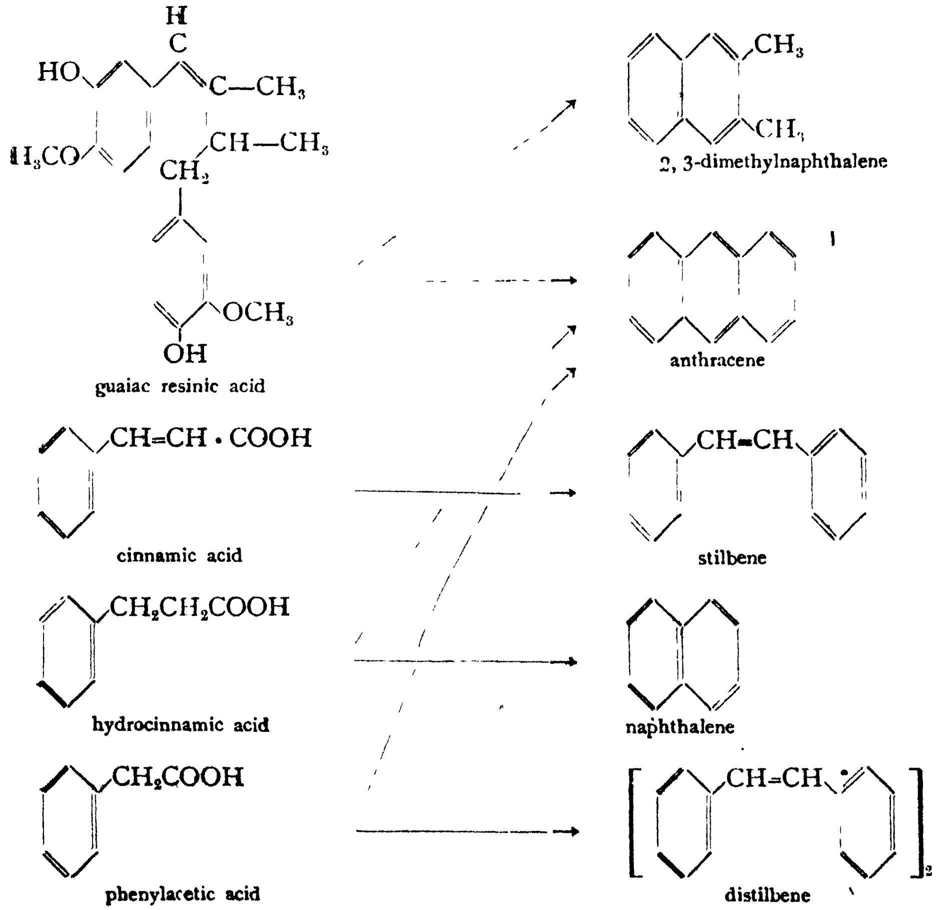
(pp. 414~418)

By Zirô Nikuni, Hiroshi Hayashi
and Susumu Tsuji.

(Agricultural Chemical Laboratory, Tokyo Imperial University; Received May 28, 1941.)

We distilled guaiac resinic acid, which was prepared from guaiac resine, with zinc dust in the current of hydrogen gas and obtained 2, 3-dimethylnaphthalene as reported by Schroeter et al⁽¹⁾.

Substrate	Distillate	Crystal	Yield (weight % to substrate)	
guaiac resinic acid 22 g	6.0 g	2, 3-dimethylnaphthalene anthracene	200 mg 60 mg	1 % 0.3 %
cinnamic acid 10 g	3.0 g	stilbene	6 mg	0.06 %
hydrocinnamic acid 10 g	2.67 g	anthracene naphthalene	trace 217 mg	 2 %
phenylacetic acid 20 g	6.1 g	anthracene distilbene	trace 800 mg	 4 %



From the distillate we isolated another crystalline substance, of which on description was found, and decided it to be anthracene.

To explain the mechanism of the formation of anthracene from guaiac resinic acid, we made the zinc dust distillation of some related compounds in the same manner.

First we distillated cinnamic acid with zinc dust, but against our expectations we isolated only a small amount of stilbene. Then hydrocinnamic acid was treated. This time anthracene was obtained in a very small amount, but main crystalline distillate was naphthalene. From phenylacetic acid, we also obtained a small amount of anthracene and an abundance of distilbene.

In each case some about the amount of yellowish oil was obtained besides the crystals, but we could not identify these. The characteristic absorption spectrum of benzene or toluene was not found from these oils.

These results are summarized as follows:

Under such high temperature, anthracene or naphthalene may form from benzene or toluene(2), which will be made from the substrate. And stilbene formation by prolonged distillation of cinnamic acid is already reported(3). But why was a large amount of anthracene or naphthalene found only in some cases? This we cannot explain at all.

Distilbene was obtained from stilbene by two years' exposure to sunlight(4). So the zinc dust distillation of phenylacetic acid may be a good method to prepare distilbene.

We express our sincere thanks to Prof. Bunsuke Suzuki for his kind guidance throughhout this work.

LITERATURE.

(1) Schroeter, Lichtenstadt, Irineu: B. **51** (1918), 1587.

(2) Berthelot: A. **142** (1867), 257; Rittman, Byron, Egloff: C. (1916) I, 861; Meyer, Hofman: M. **37** (1916), 687.

(3) Miller: A. **189** (1877), 340.

(4) Ciamician, Silber: B. **35** (1902), 4129.

Über die quantitative Bestimmung der Pyrethrine.

IX. Mitteilung. Veranderung von Pyrethrinen durch Licht und Warme.

(SS. 419~426)

Von Sankiti TAKEI, Kiyosi WAKAZONO und Keizo HIRAOKA.

(Aus d. Institut f. Chem. Forschung, Universität Kyoto; Eingegangen am 6. Mai 1941.)

Ascorbic Acid Content of Citrous Fruits.

(pp. 427～432)

By Yasuo IWASAKI and Toshio KOMATSU.

(Institute for Instruction in Rural Industry, Department of Agriculture and Forestry;
Received May 5, 1941.)

1. The amount of ascorbic acid in Satsuma orange increases according to the ripeness of the fruit. On December 20th the proportion is 38.6 mg/% in the pulp and 212.0 mg/% in the rind. However, the proportion rapidly increases when the orange is changing its color, from the middle to the end of November, both in the pulp and in the rind.

2. The ascorbic acid content in each segment of a given orange is the same. However in rind, there is no marked variation in the individual orange when green (unripened fruit), but there is a conspicuous difference in the early ripening period.

3. In comparing the ascorbic acid content of the upper part of the orange (where the style has been attached) with the lower (where the pedicel has been attached), it is found that there is more ascorbic acid in the rind of the lower part, but there is almost the same amount in the pulp of the two parts.

4. The outer rind contains more ascorbic acid than does the albedo or white rind.

5. The ascorbic acid content of other citrous fruits than Satsuma orange was determined.

Researches on Mechanical Wood Pulp. (Part VII).

The Practical Application of the Fiber Classifier to Pulp-Studies.

By K. KIMURA.

(pp. 433～446)

(Agricultural Chemical Laboratory, Kyoto Imperial University; Received May 7, 1841.)

Simpler Estimation of Copper Number of Pulp.

(pp. 447～457)

By S. HONDA and K. HAGIWARA.

(Agricultural Chemical Laboratory, Kyoto Imperial University; Received April 18, 1941.)

Dietary Studies on the Increase of Utilizing Value of Northern Farm Animals. (III).

Experiment on Sheep with Hydrolyzed Products
of Human Hair. (Part 1).

(pp. 458～464)

By E. TAKAHASHI, K. SHIRAHAMA and M. YOSHIDA.

(Agric. Chem. Labo., Hokkaido Imperial University; Received April 26, 1941.)

Studies on Methionine and its Derivatives. (I).

On the Detection of Methionine.

(pp. 465~475)

By Yoshio TSUCHIYA.

(S. Suzuki and Co., Ltd.; Received May 17, 1941.)

The present author has found that methylmercaptan was formed from methionine by alkali-fusion. And when the mercaptan is introduced into the isatin-sulfuric acid (0.01~0.02 g isatin to 100 cc H_2SO_4), the yellow color of the reagent becomes grass green.

Applying this color reaction to the protein hydrolysates, the author has now established the detection method of methionine. The color reaction is not given by cystine, from which sulfretted hydrogen is produced under the same experimental conditions. In this case, the yellow color of the reagent becomes first a light rose and then gradually diminishes and finally a dilute milky turbidity is produced.

Sulfuretted hydrogen, on the contrary, inhibits this reaction.

Therefore, when both methionine and cystine are present in the same sample, like protein hydrolysates, the gas produced must be introduced after the sulfuretted hydrogen is separated from the gas mixture of CH_3SH and H_2S, by passing it through the powdered lead acetate tube.

Of the naturally occurring amino acids, methionine only gives this reaction. No perceptible color change of the reagent is observed by the other amino acids such as glycine, alanine, valine, leucine, phenylalanine, tyrosine, proline, aspartic acid, glutamic acid, lysine, arginine, and histidine. And also, neither the mixture of the amino acids except methionine, especially that of cystine and the others, nor that of cystine and carbohydrates such as glucose, maltose, lactose, levurose, and sucrose, gives this reaction. In other words, methylmercaptan is not produced from these mixtures under this procedure.

While the same color change as methionine is observed in the case of employing the mixture of cystine and betaine, and also in the case of employing the compounds containing methylmercapto group such as γ-methylmercapto-α-oxybutylic acid, γ-methylmercapto-propyl-amine, and γ-methylmercapto-propyl-alcohol (methionol), the oxidative derivatives of methionine such as methionine sulfoxide, β-methylsulfone-propionic acid, and homocystine, from which sulfuretted hydrogen is produced like cystine, cause no color changes in the reagent. Accordingly, it is clear that the color reaction of isatin-sulfuric acid reagent was characteristic for methylmercapto group.

The sensibility of this detection method is very sharp, i. e., this reaction is positive even in the case of employing 0.2 mg of methionine.

When this method is applied to the protein hydrolysates, cystine can also be detected at the same time as methionine, by ascertaining the formation of black lead sulfide from lead acetate.

Care must especially be taken that the excess of water is entirely removed from the sample before experiment. Otherwise sulfuretted hydrogen is also formed from methionine by the secondary decomposition of methylmercaptan in the presence of alkali and water, thus causing the diminution of the sensibility of the detection of methionine itself, as well as mistake in judgement of the detection of cystine.

The common procedure of this detection method of methionine (as well as cystine) is as follows:—0.2∼100 mg of the dried sample and 3∼5 drops of KOH or NaOH (0.45∼0.75 g) are taken in the test tube (ca. 20 cc) and fused in the flame of burner for 1∼2 minutes. After the fused mass thus obtained is acidified with dilute sulfuric or hydrochloric acid, the gas mixture of CH_3SH and H_2S now liberated is passed first through the lead acetate tube and then through the isatin-sulfuric acid by means of aeration.

Thus the author has ascertained that, considering from this detection method, the comparative contents of methionine and cystine in several proteins such as egg albumin, casein, hemoglobin, edestine, gelatine, soybean protein, gluten, silk and wool, were identical with those found quantitatively, which had been hitherto reported in literature.

On the Chemical Studies of the Bagasse Pulp. (4).

(pp. 476∼478)

By Tetutaro TADOKORO, Masao NISHIDA and Keizō ITō.
(Hokkaido Imperial University; Received May 15, 1941.)

Researches on Bamboo in Taiwan as a Raw Material for Pulp. Part V.

(On the Digestion of "Keitiku" by the Magnesium Sulfite Method).

(pp. 479∼482)

By Minoru TUTIYA, Setuo FUKUHARA and Yoshiteru KATO.
(Industrial Research Institute of Taitu; Received May 5, 1941.)

It is absolutely necessary for the pulp making of bamboo (or Gramineae) by sulfite method for a little or the same quantity of sulfite to be present in the cooking liquid, i.e., its constitution is $Mg(HSO_3)_2 + MgSO_3$. Otherwise we cannot obtain the pulp, because at the temperature of 145∼150°C, the chip becomes black by sulfuric acid from sulfurous acid. Owing to this, bamboo cannot be digested by Ca-sulfite liquid at these temperatures. Excess of free acid is fatal to the pulp making of the bamboo. Using a liquid which was in very slight excess of $MgSO_3$, we obtained pulp but it was not good in quality and yield. Our experiments were undertaken at maximum temperatures of 145°C and 150°C. When cooked at lower temperature such as 100°C (80 hrs.), 130°C (2 hrs., to elevate to 130°C spending 8 hrs.), using Ca-sulfite liquid, we obtained pulp. But these methods would not be applicable for commercial purposes.

We arrived at the following conclutions :—

1. We obtained light coloured and bleachable pulp from "Keitiku" by Mg-SO_3 process, as well managed as by the Ca-sulfite method, in respect to the temperature and hours.

2. For bamboo pulp making Ca-sulfite process is not suitable for commercial purposes. The constitution of the cooking liquid must be $Mg(HSO_3)_2+MgSO_3$, and a small quantity of soluble $MgSO_3$ is absolutely necessary.

3. The best conditions are as follows :—

Total SO_3 is more than 4%. Insufficient quantity of SO_2 induces failure.

Maximum temperature is 145~150°C (5 hrs.) and total cooking hours is 8 hours.

4. The pulps were rich in ash and pentosan, and the values of Cu-index were a little high. These characteristics are not agreable for artificial silk or staple fibre, but may be used for paper making.

5. The pulps obtained by maximum temperature of 145°C were good in physical characters, but bad in the contents of non-cellulose matters, and by 150°C were bad in physical characters but good in non-cellulose contents.

6. The pulp for artificial silk or staple fibre cannot be obtained from bamboo by single cooking of sulfite method for commercial purposes.

On the Flavonol Glucoside of Euphorbia thymifolia L.

(pp. 483~484)

By Makoto NAGASE.

(Agricultural Chemical Department, Taihoku Imperial University Taiwan;
Received May 16, 1941.)

The leaves and stems of Euphorbia thymifolia L. were extracted with ethanol and the solvent was evaporated in vacuum. The aqueous solution of the residue was extracted with acetic ester. From the concentrated extract a flavon glucoside was isolated (yield 0.037 %) which formed yellow needles (mp. 203~203°) from aceton and had the formula $C_{21}H_{20}O_{10}+2H_2O$. On hydrolysis with dilute H_2SO_4, the glucoside gave one molecule of apigenin (tri actate mp. 182°) and glucose (phenyl-osazone mp. 201°).

When the glucoside was mixed with 5, 7, 4′-trioxyflavon-7-glucoside, obtained from apiin by E. v. Gerichten's method, the melting point was not depressed.

Thus the isolated glucoside was proved to be 5, 7, 4′-trioxyflavon-7-glucoside.

Functional Studies on Soil (XXIII~XXVI).

(pp. 485~490)

By Hideo MISU,

(Agricultural Experiment Station, Government General of Tyosen;
Received May 13, 1941.)

Vol. 17 July 1941 No. 7

Bulletin of the Agricultural Chemical Society of Japan.

TRANSACTIONS

Untersuchungen über den Kohlenhydratstoffwechsel im Zuckerrohr mit Hilfe der Pikrinsäuremethode.

Von T. YOSHIDA, B. WO, T. FUKUURA
und K. YAMAFUJI.

(Aus dem Institut für Zuckerforschung in Tainan)

Eingegangen am 24. 4. 1941.

Bei den physiologischen Untersuchungen des Zuckerrohrs sind wir oft genötigt, eine grosse Anzahl Rohrstengel zugleich zu behandeln. Die Zuckerbestimmung muss in diesem Falle leicht und schnell ausgeführt werden. In der vorliegenden Arbeit haben wir die colorimetrische Methode zur Zuckerbestimmung mit Pikrinsäure nach *Lewis-Benedict-Schachkeldian*(1) modifiziert und die modifizierte Methode auf die Untersuchungen über das Verhalten der Zuckerarten im Zuckerrohr angewandt.

1. ZUR ZUCKERBESTIMMUNG MITTELS PIKRINSÄURE.

1 cc Glucoselösung wird in ein kleines Reagensglas eingetragen, mit 1 cc Pikratlösung (5 g Pikrinsaure + 27,5 g wasserfreies Natriumcarbonat in 1 Liter Wasser) versetzt, geschüttelt und dann 15 Minuten im siedenden Wasserbad erhitzt. Nach dem Abkühlen wird die entstandene Farbe mit dem Standard verglichen. Zur Bereitung der Standardlösung wird eine Lösung von 1 mg Glucose pro Kubikzentimeter in derselben Weise behandelt (Tabelle I).

Tabelle I.

Zugesetzte Glucose in mg	Gefundene Glucose in mg	Zugesetzte Glucose in mg	Gefundene Glucose in mg
0,4	0,44	2,0	2,00
0,6	0,63	3,0	2,95
1,0	1,00	4,0	4,00
1,5	1,54	5,0	5,00

Wir haben weiter Versuche mit Fructose durchgefuhrt und gefunden, daß auch dieser Zucker nach dem obenerwähnten Verfahren bestimmt werden kann. Bei der Bestimmung von Saccharose werden 0,7 cc Zuckerlösung mit 0,1 cc 1 *n* HCl

10 Minuten im siedenden Wasserbad erhitzt. Nach dem Neutralisieren mit 1 n NaOH unter Zusatz einer sehr geringen Menge 0,1 proz. Methylorange wird zur Lösung 1 cc Pikratlösung hinzugefügt und dann die Färbung gegen einen Standard colorimetriert. Die Standardlösung kann mit einer bekannten Menge reiner Saccharose in derselben Weise bereitet werden. Bei der Zuckermenge über 6 mg müssen 2 cc Pikratlösung zugesetzt werden.

Rohrzucker wird aber auch durch Erhitzen mit Pikratlösung allein etwas invertiert. Wenn daher die zu untersuchende Lösung Saccharose enthält, so ist stets eine Korrektion notwendig. Unter den oben beschriebenen Bedingungen entstehen durchschnittlich aus 1 g Rohrzucker 0,22 mg Invertzucker (Tabelle II).

Tabelle II.

Zugesetzter Rohrzucker in g	1,0	0,5	0.2
Entstandener Invertzucker in mg	0,20	0,10	0,05

Wenn man zu einer Natriumpikratlösung Mercurichlorid hinzufügt, so entsteht ein rotbrauner Niederschlag. Diese Substanz ist daher als antiseptisches Mittel der Zuckerlösung ungeeignet. Die Versuchsergebnisse über den Effekt einiger Reagenzien auf die Farbung durch Zucker und Pikrinsaure sind in Tabelle III wiedergegeben.

Tabelle III.

	Farbenintensität		Farbenintensität		Farbenintensität
Ohne Zusatz	100	0,2 g Na_2CO_3	125	0,01 g HgI_2	93
0,1 g NaCl	100	0,1 g Na_2CO_3	115	0,005 g HgI_2	100
0,05 g NaCl	100	0,05 g Na_2CO_3	103	0,002 g HgI_2	100

Die mit Zucker und Pikrat hergestellte Standardlösung entfärbt sich allmählich. Nach zahlreichen Vorversuchen konnten wir eine Reihe von haltbaren Standardlösungen bereiten (Tabelle IV).

Tabelle IV.

Glucose in mg	g in 10 cc Wasser		Glucose in mg	g in 10 cc Wasser	
	$CoCl_2\cdot 6H_2O$	$K_2Cr_2O_7$		$CoCl_2\cdot 6H_2O$	$K_2Cr_2O_7$
0,1	0	0,016	1,0	2,00	0,400
0,2	0	0,080	1,5	3,00	0,200
0,4	0	0,560	2,0	3,92	0,016
0,6	1,00	0,200			

2. Ueber das Verhalten der Zucker im Zuckerrohr.

Zur Bestimmung der reduzierenden Zucker im Zuckerrohrsaft wird 0,1 cc Saft mit 0,9 cc Wasser und 1 cc Pikratlösung versetzt. Bei der Saccharosebestimmung wird zu 0,02 cc′ Saft 0,5 cc Wasser zugesetzt und die Mischung in der obenerwähnten Weise mit Salzsäure invertiert. Die Versuche in Tabelle V dienen als Belege für die Verwendbarkeit dieser Methode zur Zuckerbestimmung im Zuckerrohrsaft.

Tabelle V.

Rohrzucker in %		Reduzierender Zucker in %	
Polarisations Methode	Pikrinsäure Methode	Jod Methode	Pikrinsäure-methode
20,01	20,20	0,52	0,55

Wir haben nun die Veränderungen des Zuckergehaltes des Zuckerrohrsaftes im Laufe des Wachstums des Rohrs mit Hilfe dieser Methode untersucht. Als Untersuchungsmaterial wurden zunächst die im September gepflanzten Rohre verwendet (Tabellen VI bis XIV).

Tabelle VI.
F 108. 8 Monate altes Rohr.

Gezählt von unten	Länge des Zwischenknotens in cm	Grade Brix	Rohrzucker in %	Reduzierender Zucker in %	Rohrzucker / Red Zucker
1. Zwischenknoten	8,5	11,5	5,0	4,25	1,175
2 〃	7,5	8,0	0,7	4,80	0,145
3 〃	9,0	5,7	0,3	3,85	0,078
4. 〃	10,0	6,0	0,2	3,85	0,052

Tabelle VII.
F 108. 9 Monate altes Rohr.

Gezählt von unten	Länge des Zwischenknotens in cm	Grade Brix	Rohrzucker in %	Reduzierender Zucker in %	Rohrzucker / Red. Zucker
1 Zwischenknoten	9	12,6	6,2	3,25	1,91
3 〃	14	8,8	3,5	3,90	0,90
5 〃	13	5,7	0,5	3,55	0,15
7. 〃	7	—	—	—	—

Tabelle VIII.
F 108. 10 Monate altes Rohr.

Gezählt von unten	Länge des Zwischenknotens in cm	Grade Brix	Rohrzucker in %	Reduzierender Zucker in %	Rohrzucker / Red. Zucker
1. Zwischenknoten	10,5	14,2	12,5	2,25	5,56
3. 〃	11,0	14,2	10,1	3,70	2,73
5. 〃	16,0	12,3	8,0	4,10	1,96
7. 〃	14,5	8,5	3,3	4,35	0,80
9. 〃	13,5	6,2	0,9	5,10	0,18
11. 〃	14,5	5,0	0,5	4,30	0,12

Tabelle IX.
F 108. 11 Monate altes Rohr.

Gezählt von unten	Länge des Zwischenknotens in cm	Grade Brix	Rohrzucker in %	Reduzierender Zucker in %	Rohrzucker / Red. Zucker
1. Zwischenknoten	6,0	16,1	14,0	1,62	8,64
4. "	11,5	16,2	11,4	3,03	3,76
7. "	12,0	12,0	6,0	5,37	1,11
10. "	13,5	11,8	4,5	6,26	0,72
14. "	10,0	7,3	0,5	5,88	0,09

Tabelle X.
F 108. 13 Monate altes Rohr.

Gezählt von unten	Länge des Zwischenknotens in cm	Grade Brix	Rohrzucker in %	Reduzierender Zucker in %	Rohrzucker / Red. Zucker
1. Zwischenkntoen	11,0	19,9	17,8	0,95	18,74
4. "	12,5	19,0	14,6	2,00	7,30
7. "	14,0	15,7	12,0	2,50	4,80
10. "	9,0	16,3	12,0	3,20	3,75
13. "	9,5	11,7	6,0	6,00	1,46
16. "	9,0	—	—	—	—

Tabelle XI.
F 108. 15 Monate altes Rohr.

Gezählt von unten	Länge des Zwischenknotens in cm	Grade Brix	Rohrzucker in %	Reduzierender Zucker in %	Rohrzucker / Red. Zucker
1. Zwischenknoten	12,0	21,1	19,0	1,15	16,52
5. "	13,5	20,3	18,0	1,25	14,40
10. "	15,0	19,3	16,5	1,90	8,68
15 "	10,0	19,9	17,0	1,50	11,33
21. "	3,0	17,3	15,0	1,50	10,00

Tabelle XII.
F 108. 16 Monate altes Rohr.

Gezählt von unten	Länge des Zwischenknotens in cm	Grade Brix	Rohrzucker in %	Reduzierender Zucker in %	Rohrzucker / Red. Zucker
1. Zwischenknoten	14,0	19,8	18,0	1,00	18,00
5. "	15,0	18,5	15,0	3,00	6,00
10. "	14,5	19,1	16,0	2,30	6,96
15. "	12,0	18,5	16,0	1,40	29,17
23 "	4,5	17,1	14,0	2,00	7,00

Tabelle XIII.

F 108. 17 Monate altes Rohr.

Gezählt von unten	Länge des Zwischenknotens in cm	Grade Brix	Rohrzucker in %	Reduzierender Zucker in %	Rohrzucker / Red. Zucker
1. Zwischenknoten	17,0	19,5	17,0	1,30	13,07
5. "	16,0	20,0	18,0	1,25	14,40
10. "	12,0	20,7	19,0	0,90	21,11
15. "	11,0	22,4	20,5	0,90	20,50
20. "	5,5	23,0	22,0	0,10	220,00

Tabelle XIV.

F 108. 18 Monate altes Rohr.

Gezählt von unten	Länge des Zwischenknotens in cm	Grade Brix	Rohrzucker in %	Reduzierender Zucker in %	Rohrzucker / Red Zucker
1. Zwischenknoten	15,5	21,6	20,5	0,10	205,0
5. "	17,5	22,5	21,5	0,20	215,0
10. "	3,0	23,0	22,0	0,10	220,0
15. "	7,0	24,1	23,0	0,05	460,0
21. "	4,0	20,4	19,5	0,05	390,0

Die oben angeführten Daten sind einige Auszüge aus unseren zahlreichen eingehenden Versuchen. Im allgemeinen werden das spezifische Gewicht und der Saccharosegehalt des Saftes mit dem Wachstum des Zuckerrohrs größer. Die Menge des reduzierenden Zuckers im Saft hingegen vermindert sich allmahlich. Der Rohrzuckergehalt ist im oberen Teil eines Stengels geringer als im unteren. Wir haben ahnliche Versuche mit F 113, 2725 POJ, 2883 POJ und 2778 POJ durchgeführt. Der Einfachheit halber werden in den Tabellen XV bis XVIII nur die maximalen Werte zusammengefasst.

Tabelle XV.

F 113.

Monate nach der Pflanzung	Länge eines Stengels in m	Gewicht eines Stengels in kg	Grade Brix des Saftes	Saccharosegehalt des Saftes in %	Rohrzucker / Red. Zucker
8	0,4	0,23	10,8	4,7	1,16
9	0,8	0,42	12,7	6,5	2,45
10	1,5	0,78	10,9	6,7	2,33
11	1,8	1,53	14,7	11,5	4,51
12	2,2	1,55	17,6	15,0	10,34
13	2,5	2,05	18,9	16,0	9,70
14	2,1	1,70	17,5	15,8	19,75
15	2,2	1,80	19,3	17,5	21,87

16	3,4	2,40	19.2	17,0	20,00
17	2,7	1,90	22,2	20,5	215,00
18	2,9	2,10	20,9	19,5	190,00

Tabelle XVI.

2725 POJ.

Monate nach der Pflanzung	Länge eines Stengels in m	Gewicht eines Stengels in kg	Grade Brix des Saftes	Saccharosegehalt des Saftes in %	Rohrzucker / Red. Zucker
8	0,4	0,25	8,0	0,6	0,10
10	0,5	1,45	11,5	8,0	2,62
12	1,6	1,47	16,3	11,9	4,76
14	2,4	1,75	18,1	15,0	6,12
16	2,7	1,50	21,5	20,5	205,00
18	2,5	2,00	24,0	23,0	195,00

Tabelle XVII.

2883 POJ.

Monate nach der Pflanzung	Länge eines Stengels in m	Gewicht eines Stengels in kg	Grade Brix des Saftes	Saccharosegehalt des Saftes in %	Rohrzucker / Red. Zucker
8	0,4	0,28	12,5	5,4	1,40
10	1,4	1,08	10,7	3,0	0,41
12	1,4	1,34	14,7	10,2	2,68
14	1,9	1,75	17,5	15,1	7,55
16	3,3	1,70	17,8	15,5	10,33
18	2,5	1,80	21,0	20,0	97,50

Tabelle XVIII.

2778 POJ.

Monate nach der Pflanzung	Länge eines Stengels in m	Gewicht eines Stengels in kg	Grade Brix des Saftes	Saccharosegehalt des Saftes in %	Rohrzucker / Red. Zucker
8	0,3	0,32	6,5	0,3	0.07
10	1,6	1,01	10,5	4,5	0,91
12	2,1	1,44	12,4	6,9	1,82
14	2,3	1,53	16,7	13,0	5,11
16	2,6	1,80	20,8	18,6	26,40
18	2,6	1,80	21,3	19,5	65,33

Auch bei F 113, 2725 POJ, 2883 POJ und 2778 POJ wurden die gleichen Veränderungen des Zuckers im Saft wie bei F 108 beobachtet. Bemerkenswert ist die Tatsache, daß während der Reife das Verhaltnis von Rohrzucker zum reduzierenden Zucker plötzlich zunimmt. Wir haben dann den Zucker im Saft aus den einzelnen Zwischenknoten der im Februar gepflanzten Rohre bestimmt. Die Tabellen XIX bis XXIII enthalten nur die maximalen Werte der ausserordentlich zahlreichen Daten. Bei den im Februar gepflanzten Zuckerrohren ist im allgemeinen die Zunahme des spezifischen Gewichts und des Saccharosegehaltes des Saftes im Laufe des Wachstums des Stengels schneller als bei den im September gepflanzten Rohren.

Tabelle XIX.

F 108.

Monate nach der Pflanzung	Gewicht eines Stengels in kg	Knotenzahl eines Stengels	Grade Brix des Saftes	Saccharosegehalt des Saftes in %	Rohrzucker / Red. Zucker
5	0,19	2	8,1	2,4	0,44
6	0,80	7	12,3	7,3	1,93
7	0,86	8	14,7	11,1	3,93
8	1,23	12	16,2	12,5	5,21
9	1,70	16	18,0	15,0	8,71
10	1,55	23	20,4	16.5	15,78
12	1,70	20	24,0	22,5	225,00
13	1,60	20	24,3	23,0	230,00

Tabelle XX.

F 113.

Monate nach der Pflanzung	Gewicht eines Stengels in kg	Knotenzahl eines Stengels	Grade Brix des Saftes	Saccharosegehalt des Saftes in %	Rohrzucker / Red. Zucker
5	0,11	3	7,5	1,4	0,25
7	1,01	13	13,6	10,0	3,70
9	1,28	18	17,5	14,5	7,21
11	1,24	19	19,0	17,0	14,78
12	1,60	19	23,3	22,0	220,00

Tabelle XXI.

2725 POJ.

Monate nach der Pflanzung	Gewicht eines Stengels in kg	Knotenzahl eines Stengels	Grade Brix des Saftes	Saccharosegehalt des Saftes in %	Rohrzucker / Red. Zucker
5	0,15	2	8,7	2,8	0,61
7	0,54	7	14,3	8,3	1,98
9	1,27	14	17,1	13,5	6,36
12	1,60	19	21,8	20,5	205,00
13	1,50	21	22,5	21,5	215,00

Tabelle XXII.

2883 POJ.

Monate nach der Pflanzung	Gewicht eines Stengels in kg	Knotenzahl eines Stengels	Grade Brix des Saftes	Saccharosegehalt des Saftes in %	Rohrzucker / Red. Zucker
5	0,17	2	6,5	0,3	0,05
7	0,65	6	12,3	6,7	1,49
9	1,03	12	15,3	10,0	2,70
12	1,55	17	21,0	20,0	140,00

Tabelle XXIII.

2878 POJ.

Monate nach der Pflanzung	Gewicht eines Stengels in kg	Knotenzahl eines Stengels	Grade Brix des Saftes	Saccharosegehalt des Saftes in %	Rohrzucker / Red. Zucker
5	0,13	2	6,4	0,5	0,09
7	0,69	8	12,1	7,0	1,40
9	1,29	14	15,6	10,5	2,92
12	1,80	20	21,2	19,5	216,66

SCHRIFTTUM.

(1) Schachkeldian, Chem. Zentr., 1929, I. 2907.

ABSTRACTS
from
TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Separation and Identification of Fatty Acids.

(pp. 491～494)

By Y. INOUYE, H. YUKAWA and H. KATSUMATA.

(Biochemical Laboratory, Department of Agriculture, Kyoto Imperial University;
Received May 17, 1941)

Part 4. Separation of Saturated and Unsaturated Fatty Acids.

Although many methods have been already proposed for the separation of saturated and unsaturated fatty acids, the authors tried to separate those acids by taking advantage of the difference in solubility of hydroxamic acid derivatives. Directly from soya bean oil, whole fatty acids were changed to hydroxamic acids, as explained in previous reports, and the mixture of hydroxamic acids were treated at 0° with alcohol, ether, petroleum ether and carbon tetrachloride separately. Each solution was filtered in cold state through a tared filter paper. The amount of insoluble hydroxamic acids obtained from 22 g of the oil was about 2.7～3.0 g in each case. And no particular difference by solvents could be seen.

It was confirmed that the insoluble fraction mostly consisted of a mixture of saturated fatty acid derivatives and the filtrate was that of the unsaturated. The neutralization and iodine values of each fraction of free acids, which were recovered by heating with dil. alc. sulphuric acid, as reported before, were determined; for instance, the neutralization value, 203.45 and 191.56, and the iodine value, 12.97 and 149.57 respectively for the insoluble and soluble fractions, using ether as solvent. Therefore, it is concluded that the oil contains about 12.3～13.6% of saturated acids as glycerides and this hydroxamic acid method may be of use for the separation of saturated and unsaturated fatty acids.

Part 5. Separation of Volatile and Non-volatile Fatty Acids.

The authors recognized, as described in the previous paper (this Journal, 16, 504, 1940.), that hydroxamic acid derivatives of fatty acids were increasingly soluble in alcohol and water as the numbers of carbon decreased. Consequently it may be considered that these properties of hydroxamic acids could be applied for the separation of volatile and non-volatile fatty acids, while the separation is, as well known, usually carried out by steam distillation. The authors prepared hydroxamic acid mixture from ethyl esters of fatty acids of coconut oil, according to the authors' usual method. The alcoholic solution of the mixture was diluted with water to 15% alcohol content and after thorough agitating, allowed to settle at room temperature for some time. The insoluble part was separated and the filtrate was evaporated under reduced pressure. Both fractions were decomposed to free acids with dil. alcoholic sulphuric acid and their mean molecular weights were determined respectively by titration. The results were as follows:

No. of experiment	Mean M.W. of original fatty acids	Mean M.W. of insoluble frac.	Mean M W. of soluble frac.
	218.80	238.18	174.38
	218.80	239.23	
3	215.56	249.01	141.27
4	215.56	238.89	
5	215.56	234 34	
6	203.67	215,24	140.93
7	203.67	221 98	
8	224.31	244.11	177.54
9	224.31	251 59	
10	224.31	254.89	
11	215.56	238 86	191.86

Compared to experiment No. 11 which denotes the figures obtained by applying the ordinary steam distillation method to the fatty acids of the same oil, the hydroxamic acid method can be satisfactorily used for the separation of volatile and non-volatile fatty acids, and at the same time for the determination of the Reichert-Meissl number.

Study of the Insecticidal Principle in the Smoke Produced by Combusting Insect Powder. (Part IV).

(pp. 495～502)

By Makoto NAGASE.

(Agricultural Chemical Department, Taihoku Imperial University, Taiwan;
Received May 16, 1941.)

I examined the insecticidal power of the neutral substances obtained from the smoke of pyrethrum, and found that the following two fractions were most effective. So I studied the composition of these fractions and reached the following results.

(1) Bp. 50～98°/10 mm (yield 131 g from 20 kg)
(2) Bp. above 100°/10 mm (yield 64 g from 20 kg)

Bp. 50～98°/10 mm ;—

a) The fraction consisted almost entirely of etherial compound.

b) By the action of HJ, it was decomposed into benzyl alcohol and ethyl iodide.

c) The maximum absorptions were at 278 μμ and 266 μμ and was identical with benzyl-ethyl ether.

From these facts this fraction was decided to be benzyl ethyl ether.

Bp. above 100°/10 mm ;—

For the purification of this fraction it was subjected to chromatographic analysis with alminium oxide.

From the strongly adsorbed part a small amount of acetophenon was obtained, and from the main part, which was hardly adsorbed, heptacosane, ethyl acetacetate and methylester of furancarbonic acid were obtained.

Studies on Methionine and its Derivatives. (II).

On the Separation of Methionine from Crude Leucine.

(pp. 503～551)

By Yoshitaro TAKAYAMA and Yoshio TSUCHIYA.

(S. Suzuki and Co., Ltd.; Received May 17, 1941.)

Natural leucine usually contains at least 5% of methionine. In the present investigation, the authors intended to separate the methionine from crude natural leucine which is obtained from soybean protein-HCl-hydrolysate, in order to establish the common separation method of methionine. After many trials, we found some difference of solubility for concentrated hydrochloric acid between methionine and leucine, i. e., the former is more soluble than the latter.

Using this property the separation of methionine was made and the procedure was as follows :—

The crude leucine is dissolved in concentrated hydrochloric acid on heating, and the leucine-HCl crystallized out on cooling, is separated and the raw material is again dissolved in the mother liquor. The second crops of leucine-HCl are separated as above.

Thus the methionine is gathered in the mother liquor. The third crops of leucine-HCl are separated by subsequent concentration of the mother liquor above obtained, or, if tyrosine is present as the concomitant, by applying the treatment with concentrated HCl to the mixture of methionine and leucine, which is obtained after tyrosine is separated by recrystallization of the free amino acid mixture from water. The remaining leucine is separated, if desired, from the mixture of the two amino acids by subsequent concentration of the mother liquor.

Thus, crude methionine, the content of which is usually 40～50%, is obtained from the last residue after HCl has been recovered from the mother liquor by neutralization and recrystallization.

In order to obtain pure methionine, two methods of separation were carried out, i. e., one, the precipitation method of the double salt of methionine and mercuric chloride, and the other, the fractional distillation method of methionine- and leucine-ester. The principle of these methods was as follows:—

(I) The crude methionine above obtained is dissolved in water and mercuric chloride solution is added to the solution. The double salt of methionine and $HgCl_2$ is now precipitated. The salt is separated from the liquid (leucine fraction) by decantation, and is dissolved in HCl, and $HgCl_2$ liberated is extracted with ether. The residual solution is neutralized with alkali, and the methionine crystallized out is purified by repeated recrystallization.

(II) The crude methionine is esterified with absolute alcohol and dried HCl, and the ester hydrochloride formed is partially neutralized by the addition of quantitative amount of Na-alcoholate. The mixture of methionine- and leucine-ester thus obtained is fractionated under reduced pressure. The results obtained are as follows:—

Fraction	Pressure (mm)	Temperature of oil bath	Temperature of vapour
First fraction	15	115°～125°	86°～ 90°
Second fraction	15	150°～160°	123°～126°

The first fraction is leucine-ester and the second one is methionine-ester.

The methionine ester thus obtained is decomposed by boiling with water, and the methionine crystallized out is purified by repeated recrystallization.

Untersuchungen über die chemischen Bestandteile der Früchte von *Rhus semialata* Murr., insbesonders die salzig Schmeckenden.

(SS. 512～520)

Von H. Uota und K. Nishida.

(Aus dem Forstchemischen Institut der Kaiserlichen Kyusyu-Universität;
Eingegangen am 30. 5. 1941.)

Nach flüchtiger Untersuchung der Früchte von *Rhus semialata* Murr. hatte A. Fuchino früher vermutet, dass ihr salziger Geschmack auf die sauren Calciumsalze der Äpfelsäure sowie der in geringer Menge beigemengten Weinsäure und Zitronensäure zurückzuführen sein dürfte.

Um dies näher zu erforschen, haben Verff. die Früchte aus Kasuya-Ensyurin

benutzt, die genügend reif waren und einen salzigen, etwas säuerlichen Geschmack

Da durch Vorprüfung das Vorhandensein von Gerbstoff, welcher hauptsächlich aus Gallotannin bestand, Gallussäure, Äpfelsäure, Weinsäure und Zitronensäure nachgewiesen wurde, von denen die drei letzteren sich darin wohl als anorganische Salze vorfanden, haben Verff. zunächst den fast getrockneten Wasserextrakt (B) mit absolutem Alkohol (A) extrahiert, um den Gerbstoff, die Gallussäure sowie die freien Säuren und ihre in Alkohol leicht löslichen Salze von den schwer löslichen Salzen zu trennen.

Beim Einengen und darauffolgenden Stehenlassen des Alkoholextraktes (A) schieden sich große Mengen Kristallnadeln aus, die nach dem Umkristallisieren aus heißem Wasser als schöne, farblose, seidenglänzende Nadeln von herbem säuerlichem Geschmack erhalten wurden, deren Smp. bei 217° lag. Durch identifizierende Reaktionen wurden sie als Gallussäure erkannt. Die Ausbeute betrug 0,3%.

Der von der Gallussäure befreite Anteil wurde in Wasser gelöst und dann mit Essigester wiederholt umgeschüttelt, um den Gerbstoff zu beseitigen. Zur Trennung der freien organischen Säuren wurde die wässerige Lösung mit Aether erschöpfend extrahiert, aber der Auszug belief sich nur auf eine Spur. Daraus kann man mit grosser Wahrscheinlichkeit schließen, dass in den Früchten keine freien Säuren vorhanden sein dürften.

Nach dem Entfärben und Einengen wurde die in Aether unlösliche wasserige Lösung mit Alkohol versetzt, wobei eine 0,3% entsprechende Menge farbloser Nadeln von säuerlich salzigem Geschmack ausschieden, die kein Kristallwasser enthielten und bei 172~173° einmal unter Abscheidung des durch weiteres Erhitzen schwer schmelzbaren Kristalls schmolzen. Sie bestehen aus Äpfelsäure und 30,01%igen Aschen, darin befinden sich Al, Ca, Mg und K in folgendem Verhaltnis:

Al	Ca	Mg	K
0,47%	0,44%	0,15%	98,94%

Aus diesen Ergebnissen wird klar, dass bei diesen Kristallen die freie Carboxylgruppe zur gebundenen im Verhältnis 2 : 1 anwesend sein muss, da die Aschen bei diesem Fall fast aus reinem K_2CO_3 bestehen müssen, was sich nur bei Annahme des übersauren Kaliummalats, d. h. Dikaliumhexamalats von der Zusammensetzung $2C_2H_3(OH)\begin{cases}COOK\\COOH\end{cases} + C_2H_3(OH)(COOH)_2$ oder $C_2H_3(OH)(COOK)_2 + 2C_2H_3(OH)(COOH)_2$, befriedigend annehmen läßt.

In Wirklichkeit wurde die Gerichtfertigkeit dieser Vermutung durch Bestimmung sowohl des in Sulfat übergeführten Aschengehalts als auch der freien Carboxylgruppe bestätigt.

	Aschen (%)	Sulfat (%)	COOH (%)
Gef.	30,01	37,40	36,71
Ber.	28,89	36,43	37,64

Der in absolutem Alkohol unlösliche Anteil (B) mit salzigem Geschmack wurde in Wasser gelöst und nach dem Entfärben und darauffolgendem Konzentrieren stehengelassen, dabei schied sich eine große Menge Kristalle aus, die sich durch Waschen mit kaltem Wasser in einen leicht löslichen und einen schwer löslichen Teil trennen liessen.

Der letztere lieferte durch Umkristallisieren aus Alkohol und Wasser farblose Nadeln oder Säulen, die mit dem vorlaufig aus dem alkoholischen Auszug erhaltenen Dikaliumhexamalat identisch waren. Die Ausbeute betrug 0,43%.

Der in kaltem Wasser leicht lösliche Teil bildete eine sauer reagierende, weiße, amorphe Masse von salzigem Geschmack, die aus Äpfelsäure nebst geringen Mengen Weinsaure und Zitronensaure sowie aus K, Al, Ca, Mg und Spuren Fe bestand. Die Ausbeute machte 0,4% aus. Die Verhaltnisse der Kationen in dem Aschenanteil sind wie folgt:

Al (enthält wenige Fe‴)	Ca	Mg	K
4,71%	0,72%	1,02%	93,54%

Die von den Kristallen getrennte Mutterlauge des Anteils (B) war auch sauer reagierend und schmeckte salzig. Um die in derselben als Salze vorhandenen Kationen zu prüfen, wurde sie nach dem Verkohlen mit verdünnter Salzsäure entzogen und darauf das so erhaltene Chlorid analysiert, dabei waren die sechs Kationen im folgenden Verhaltnis vorhanden:

Al	Fe	Ca	Mg	K	Na
14,28%	0,68%	2,22%	0,54%	82,28%	Spur.

Es trifft wohl aber zu, dass man die Existenz des Natriumions nicht seinem Salz der Oxypolycarbonsauren, vielmehr gewohnlichen anorganischen Salzen zuschreibt, die sich im allgemeinen im Pflanzengewebe befinden.

Um die Menge der gesamten Sauren und der einzelnen festzustellen, haben Verff. hierauf 500 g Früchte mit kaltem Wasser extrahiert und nach dem Beseitigen von Gerbstoff und Gallussaure durch Umschutteln mit Essigester jede Saure nach G. Jorgensen sowie Albahary getrennt, wodurch 1,86 g saures K-Tartarat, 0,8 g Zitronensaure und 34,6 g Pb-Malat erhalten wurden, daraus folgt:

	Apfelsäure	Weinsäure	Zitronensäure
Säuremenge (g)	11,8	1,48	0,8
Im lufttrockenen Material (%)	2,90	0,26	0,16
Im absol. getrockneten Material (%)	3,46	0,35	0,19
Der gesamten Säure (%)	83,81	10,51	5,68

Zur Bestimmung des Gehalts an organischen Salzen in den Früchten haben Verff. zunachst den durch Hautpulver vom Gerbstoff befreiten Wasserextrakt mit Essigester quantitativ erschopfend umgeschuttelt, bis im Auszug keine Gallussaure mehr nach der Youngschen Reaktion nachweisbar war, zum Trocknen gebracht, dann gewogen und die Gewichtsdifferenz, nach Abzug der Menge der aus dem Hautpulver gelosten organischen Stoffe, die durch Kontrolle direkt ermittelt wurde, als die annähernde Menge der organischen sauren Salze angesehen. Der Gehalt an Gerbstoff, Gallussäure und organischen Salzen war wie folgt:

Gerbstoffgehalt (%)		
Im Heisswaßerextr.	Im lufttrock, Material	Im absol. trock, Material
37,75	5,00	5,96

		Gerbstoff, Gallussäure und Salze			
	Kaltwasser-extrakt	Tannin	Gallus-säure	Salze	Aschen
Im Kaltwasserextrakt (%)	—	35,17	9,67	55,16	—
Im lufttrockenen Material (%)	9,19	3,23	0,89	5,07	—
Im absol, trockenen Material (%)	10,96	3,85	1,06	6,05	—
In den Salzen (%)	—	—	—	—	29,28

Aus allen obigen Ergebnissen kann man schließen, daß der Geschmack der Früchte von *Rhus semialata* Murr. zum Teil auf Gerbstoff und Gallussäure, zum grössten Teil aber auf den sauren Salzen des K, Al sowie Ca, Mg und Fe beruht, deren Gehalt im lufttrockenen Material etwa 5% entspricht.

In den Früchten findet sich noch zu 7,78% Japanwachs-ahnliches Fett, das im absolut getrockneten Material zu 9,27% vorkommt, dessen Eigenschaften folgende sind: n_D^{26} 1,6502; *S.Z.* 32,17; *V.Z.* 215,80; *E.Z.* 183,06; *J.Z.* 43,70.

Functional Studies on Soil (XXVII~XXIX).

(pp. 521~526)

By Hideo Misu.

(Agricultural Experiment Station, Government General of Tyosen;
Received May 13, 1941.)

Biochemical Studies of "Bakanae" Fungus.

Part 8. Effect of Gibberellin on Soybean Malt.

(pp. 527~528)

By T. Yabuta, Y. Sumiki, N. Murayama,
and K. Suzuki.

(Tokyo Imperial University;
Received June 23 1941.)

The Effect of Cold Storage upon Vitamin A Content of Whale Livers.

(pp. 529~534)

By T. MORI and S. ASAKAWA.

(Tokyo Imperial University; Received June 9, 1941.)

On the Chemical Studies of the Bagasse Pulp. (5)

(pp. 535~536)

By TETUTARO TADOKORO, Masao NISHIDA,
and Keizo ITO.

(Hokkaido Imperial University; Received May 15, 1941.)

On the Oxidizing Enzymes in Tea Leaf. II.

(pp. 537~543)

By Hideiti TORII.

(Imperial Tea Experiment Station; Received May 21, 1941)

In this report, the relation between the content of enzyme and the quality of made tea is examined. And the variations of tannin and catechin during the fermentation of tea leaf are studied.

Studies on the Tannin of *Acasia confusa* Merrill. (II)

(pp. 544~546)

By Minoru ISHII.

(Agricultural Chemical Department, Taihoku Imp. University, Taiwan;
Received June 19, 1941.)

The author made some chemical researches on the tannin of *Acasia confusa* Merrill.

By the disintegration of the tannin with dilute sulphuric acid or concentrated soda solution, phloroglucine was obtained besides a large amount of phlobaphene.

Methyl and acetyl derivatives which were prepared according to the ordinary methods gave the analytical data in carbon, hydrogen, methoxyl or acetyl values identical with those of methyl- or acetyl-catechin.

As the oxidation product of methyl tannin, veratric acid was confirmed.

Molecular weight determinations were carried out according to the osmotic pressure method and evullioscopic method, and the results obtained were as follows:

Osmotic pressure method (in alcohol) = 573, (in acetone) = 650
Evullioscopic method (in alcohol) = 1078

From these investigations it would seem that this tannin is probably constituted by the condensation of at least 2 or 4 molecules of catechin.

Studies on Red Yeast. 1. *Sporobolomyces* nov. sp.

(Report 1) Morphology and Physiology of the yeast *Spolobolomyces* nov. sp.

(547～552)

By Izue YAMASAKI and Seizi MORISITA.

(Agricultural Chemical Institute, Kyûshû Imperial University, Hukuoka;
Received June 21, 1941.)

According to the morphological and physiological studies, the yeast was found to belong to Genus *Sporobolomyces* Kluyver and van Niel(1), the so-called "Image former yeast," but to coincide with none of the known species described by the above mentioned authors and also by Derx.(2)

So we describe the yeast provisionally as *Sporobolomyces* nov. sp.

(1) A. J. Kluyver and C. B. van Niel: Zentbl. f. Bakt. II Abt., Bd. **63**, 1 (1925).
(2) H. G. Derx: Ann. Mycologici., Vol. **28**, 1 (1930).

Studies on the "P'u-hwang" Seed Oil.

(pp. 553～558)

By Yuiti SHINOZAKI and Sizuo TAKUMI.

(Central Laboratory, South Manchuria Railway Company, Dairen, Japan;
Received June 20, 1941.)

The authors have investigated the chemical constituents of the seed oil of "P'u-hwang" grown in Manchuria.

The results may be summarized as follows;

(1) The seeds contain 20.3% of crude fatty oil (ether extract).
(2) The crude oil has the following constants;

Ref. Ind. (at 25°C)	1.4740	Density (25°C/15°C)	0.9256
Sap. V.	193.96	R. M. V.	0.22
Acid. V.	19.1	Polenske V.	0.42
Iod. V.	130.8	Unsap.	3.64%

It belongs to the semi-drying oil.

(3) From the solid fatty acids, palmitic, stearic, and arachidonic acids have been identified.

(4) The unsaturated fatty acids seem to consist chiefly of oleic acid and linolic acid.

(5) From the unsaponifiable substances, we have obtained some saturated hydrocarbons containing pentakosan and a substance melting at 63°C.

As phytostetin, typhasterins (m. p. 134°C～137°C) have been isolated.

On the Chemical Mechanisms of Enzymatic Hydrolysis of Oils and Fats. Part 1.

Splitting of Fatty Acid Residues from Natural Oils by Ricinus Lipase Action.

(pp. 559～565)

By Y. Inouye and G. Shintani.

(Biochemical Laboratory, Department of Agriculture, Kyoto Imperial University;
Received June 19, 1941.)

It may be considered that the further clearing up of the chemical mechanisms of enzymatic hydrolysis and synthesis of fats and oils will contribute to a better understanding of their physiological meanings in living organisms. Although many reports have been already issued in respect to the hydrolysis in alkaline or acidic medium and also by enzymes, many fundamental questions still remain in doubt. In the present work the authors tried to explain which fatty acid in glycerides, longer or shorter chained, would be split first from natural oils or fats by the action of ricinus lipase and at the same time to make clear how the unsatura-
After some investigations were carried out on the activity of castor seed
tion of fatty acids in glycerides might have a relation to the enzymatic hydrolysis of natural oils.
powder which had been previously treated with ether, the condition of experiments was defined as follows: 1 g of oil or fat and 50 mg of pretreated castor seed powder were mixed with 0.5 cc of 0.1 N acetic acid and 0.5 cc water, following the incubation at 36°C. The reaction mixture was extracted with ether and after neutralizing with alcoholic potash, free fatty acids were precipitated with calcium chloride. The calcium soap was filtered and washed with ether-alcohol mixture and finally free acids were recovered by the ordinary method. The filtrate was evaporated under vacuum and its acetyl value, saponification value and melting point were determined. And then these partially decomposed and undecomposed glyceride mixtures were saponified with alcoholic potash and free acids were collected to determine the neutralization and iodine values.

Coconut oil, olive oil, sesame oil and cotton seed oil were used as substrates. For instance, the following table shows the neutralization values of split and unsplit fatty acids of coconut oil in the course of the enzymatic hydrolysis.

Time (hours)	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	24.0
Split fatty acids	266.75	266.72	265.15	257.33	269.25	256.86	254.83	261.22	257 66
Unsplit fatty acids	283.50	280.31	278.84	282.27	284.30	287.01	281.18	287.53	285.92

This oil being characterized by containing both longer and shorter chained fatty acids, the results show that the higher fatty acids would react easier to the enzyme than the lower fatty acids.

The second table shows neutralization values, iodine values and approximate melting points of each split and unsplit fatty acids which were isolated at intervals from the reaction mixture of enzymatic hydrolysis of cotton seed oil.

Time (hours)		0.5	1.0	2.0	3.0	4.0	5 0	6.0	8.0	24.0
Acid value of substrate		28.66	30.91	52.23	76.38	98.06	115.59	123.44	140.84	181 22
Neutralization value,	split	194.26	201.19	200.12	199.92	201.68	198 64	209.18	199.18	201.08
	unsplit	210.30	199.21	198.84	208.75	203.06	195.32	201.38	189 08	212.84
Iodine value	split	24.82	25 11	27.55	27.44	28.95	29.19	37.96	37.80	64.24
	unsplit	77.61	83.15	88.73	96.82	96.93	96.16	89.41	101.40	103.54
Approx. melting pt.	split	61.0°						52.0°	50.5°	50.0°
	unsplit	39 0°						32.0°	28.0°	25.5°

No appreciable differrence was found in the figures of neutralization values which should be due to the poor content of volatile acids in cotton seed oil, whereas saturated acids were confirmed to have more tendency to be split from glycerides than the unsaturated.

Glutathione Content of Liver.

(Lubus dexter, Lubus sinister, Lubus anterior, Lubus posterior,
Lubus papiliformis, Lubus caudatus).

(pp. 566～568)

By Masayoshi Ogawa and Yutaka Seto.

(Department of Nutrition, College of Medicine, Nippon University;
Received June 19, 1941.)

On the Metabolism of Organic Acids by Bacteria. III.

(pp. 569~577)

By S. TADA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received June 12, 1941.)

Studies on Bios. Part III.

Synthesis of Na-*dl*-Pantothenate.

(pp. 578~580)

By Nobusada OKOTI and Tomozi EGAWA.

(Agricultural Chemical Labolatory, Faculty of Agriculture, Tokyo Imperial University;
Received June 21 1941.)

Vol. 17 August 1941 No. 8

Bulletin of the Agricultural Chemical Society of Japan.

TRANSACTIONS

Weiteres über die Bestandteile des Zuckerrohrs.

Von K. HONDA, C. WO, N. MIYAJI
und K. YAMAFUJI.

(Aus dem Institut für Zuckerforschung in Tainan)

Eingegangen am 24. 4. 1941.

Im Anschluss an die vorhergehenden Arbeiten(1)(2) haben wir noch eingehendere Untersuchungen über die chemischen Bestandteile des Zuckerrohrs ausgeführt.

1. UEBER DEN ZUCKERROHRSAFT.

Der durch Pressung des Zuckerrohrstengels erhaltene Saft (A) wurde einerseits filtriert (B) und andererseits nach dem Erhitzen filtriert (C). Die Säfte wurden getrennt analysiert (Tabellen I bis VII).

Tabelle I.
12 Monate altes Rohr.

	F 108: A	F 108: B	F 108: C	2725 POJ: A	2878 POJ: A	2883 POJ: A
Grade Brix	16,42	16,49	16,61	13,81	12,06	13,20
Saccharose in %	12,87	12,94	12,90	9,69	6,94	8,24
Reinheit	78,38	78,48	77,66	70,22	57,55	62,73
Reduzierender Zucker in %	2,65	2,65	2,77	3,81	3,78	4,13
Gummi-Pektin in %	0,09	0,08	0,04	0,12	0,09	0,08
Asche in %	0,282	0,276	0,265	0,197	0,144	0,139
Stickstoff in %	0,030	0,019	0,014	0,016	0,023	0,016
Aether-Extrakt in %	0,077	0,054	0,020	0,034	0,159	0,031

Tabelle II.
13 Monate altes Rohr.

	F 108: A	F 108: B	F 108: C	2725 POJ: A	2778 POJ: A	2883 POJ: A
Grade Brix	17,98	17,98	17,98	13,52	15,01	14,30
Saccharose in %	15,91	15,96	15,92	9,38	11,86	10,58

Reinheit	88,49	88,77	88,54	69,48	75,96	73,99
Reduzierender Zucker in %	1,11	1,04	1,19	2,44	2,87	2,86
Gummi-Pektin in %	0,14	0,08	0,02	0,09	0,096	0,074
Asche in %	0,260	0,247	0,239	0,199	0,176	0,106
Stickstoff in %	0,022	0,020	0,011	0,014	0,021	0,014
Aether-Extrakt in %	0,018	0,016	0,014	0,020	0,047	0,013

Tabelle III.
14 Monate altes Rohr.

	F 108 : A	F 108 : B	F 108 : C	2725 POJ : A	2878 POJ : A	2883 POJ: A
Grade Brix	16,51	16,51	16,50	16,07	17,07	16,57
Saccharose in %	14,35	14,35	14,37	12,95	13,58	13,53
Reinheit	86,92	86,92	87,93	85,93	79,55	82,00
Reduzierender Zucker in %	0,68	0,66	0,73	2,10	2,66	2,06
Gummi-Pektin in %	0,13	0,10	0,04	0,13	0,14	0,03
Asche in %	0,280	0,265	0,254	0,149	0,186	0,111
Stickstoff in %	0,020	0,016	0,013	0,017	0,022	0,025
Aether-Extrakt in %	0,045	0,017	0,009	0,055	0,040	0,068

Tabelle IV.
16 Monate altes Rohr.

	F 108 : A	F 108 : B	F 108 : C	2725 POJ : A	2778 POJ : A	2883 POJ : A
Grade Brix	19,82	19,46	19,43	19,60	19,10	18,50
Saccharose in %	17,80	17,90	17,82	18,45	17,64	16,41
Reinheit	89,90	91,90	91,86	94,13	92,36	88,70
Reduzierender Zucker in %	0,47	0,32	0,36	0,37	0,61	1,08
Gummi-Pektin in %	0,15	0,09	0,03	0,16	0,25	0,16
Asche in %	0,232	0,228	0,204	0,168	0,144	0,166
Stickstoff in %	0,026	0,022	0,010	0,017	0,031	0,018
Aether-Extrakt in %	0,032	0,014	0,013	0,017	0,020	0,020

Tabelle V.
17 Monate altes Rohr.

	F 108 : A	F 108 : B	F 108 : C	2725 POJ : A	2778 POJ : A	2883 POJ : A
Grade Brix	21,00	20,92	21,48	20,60	19,78	20,12
Saccharose in %	19,81	19,95	20,07	19,43	18,20	18,93
Reinheit	94,33	95,36	93,43	94,32	92,01	94,15
Reduzierender Zucker in %	0,21	0,19	0,32	0,20	0,59	0,43
Gummi-Pektin in %	0,206	0,123	0,058	0,157	0,205	0,233
Asche in %	0,339	0,321	0,304	0,284	0,290	0,240

Stickstoff in %	0,024	0,016	0,009	0,018	0,033	0,027
Aether-Extrakt in %	0,028	0,022	0,010	0,018	0,019	0,014

Tabelle VI.

18 Monate altes Rohr.

	F 108: A	F 108: B	F 108: C	2725 POJ: A	2778 POJ: A	2883 POJ: A
Grade Brix	21,16	21,05	21,62	21,16	20,16	21,66
Saccharose in %	20,30	20,23	20,65	20,18	19,11	20,69
Reinheit	95,93	96,10	93,66	95,36	94,79	95,42
Reduzierender Zucker in %	0,19	0,19	0,26	0,19	0,29	0,19
Gummi-Pektin in %	0,144	0,132	0,038	0,143	0,176	0,188
Asche in %	0,223	0,219	0,209	0,381	0,264	0,318
Stickstoff in %	0,032	0,028	0,017	0,023	0,028	0,035
Aether-Extrakt in %	0,027	0,024	0,023	0,023	0,032	0,032

Tabelle VII.

20 Monate altes Rohr.

	F 108: A	F 108: B	F 108: C	2725 POJ: A	2778 POJ: A	2883 POJ: A
Grade Brix	21,56	21,40	21,39	18,10	19,29	18,74
Saccharose in %	20,67	20,60	20,66	16,50	17,87	17,25
Reinheit	95,87	96,26	95,59	91,16	92,64	92,05
Reduzierender Zucker in %	0,20	0,23	0,27	0,53	0,42	0,35
Gummi-Pektin in %	0,162	0,058	0,029	0,113	0,178	0,152
Asche in %	0,247	0,198	0,143	0,286	0,266	0,222
Stickstoff in %	—	—	—	0,021	0,021	0,021

Das spezifische Gewicht, der Saccharosegehalt, die Menge des reduzierenden Zuckers sowie des Aether-Extraktes und die Reinheit verändern sich mit dem Wachstum des Rohrs viel starker als der Gehalt des Saftes an Gummi-Pektin, Asche und Stickstoff. Der Unterschied der Bestandteile zwischen den verwendeten, vier praktisch wichtigen Rassen ist verhaltnismassig gering. Durch Filtrieren oder Erhitzen wird ein Teil von Gummi-Pektin, Aether-Extrakt, Stickstoff und Asche entfernt.

2. Ueber die Bagasse.

In einer früheren Mitteilung haben wir über die Bereitung eines Bagassezellstoffs von ziemlich guter Qualität berichtet.(2) Wir konnten in der vorliegenden Untersuchung einen Zellstoff von noch besserer Qualität aus Bagasse herstellen.

Wenn man eine wässerige Zellstoffsuspension mit Chlorgas behandelt, so entsteht Salzsäure (Tabelle VIII).

Tabelle VIII.

Roe-Wert des Zellstoffs	1,95	2,28	2,61	5,39	6,01
Entstandene HCl in g pro 100 g Zellstoff	0,44	0,80	1,13	3,21	3,42
$\frac{\text{Entstandene HCl}}{\text{Verwandtes Cl}}$	22,44	35,18	43,31	51,53	57,03

In dieser Arbeit haben wir versucht, solche bei der Bleichung des Zellstoffs gebildete Salzsäure zum Aufschluß der Bagasse zu benutzen. Zu diesem Zweck wurden 500 g Bagasse eine Stunde mit einer sehr verdünnten Salzsäure auf 153° erhitzt. Die Analyse der in dieser Weise vorbehandelten Bagasse ergab folgendes Resultat (Tabelle IX).

Tabelle IX.

Erhitzt mit		0,1 %iger HCl	0,05 %iger HCl	0,025 %iger HCl	0,01 %iger HCl
Ausbeute in %		53,40	57,87	67,00	74,51
		In % der Trockensubstanz			
Asche		3,91	5,12	5,39	3,79
Pentosan		3,71	8,36	14,93	19,05
Lignin		34,48	30,10	29,44	25,96
Cellulose		66,02	66,54	64,79	61,59
In % der Cellulose	α-Cellulose	88,20	87,16	85,21	77,41
	β-Cellulose	10,45	11,09	12,13	17,01
	γ-Cellulose	1,35	1,75	2,66	5,58

Die mit Salzsäure vorbehandelte Bagasse wurde dann eine Stunde mit einer 10fachen Menge 1 %iger Natriumhydroxydlösung auf 152° erhitzt. Die chemische Zusammensetzung der erhaltenen Zellstoffe ist in der Tabelle X angegeben.

Tabelle X.

Vorbehandelt mit	0,1 %iger HCl	0,05 %iger HCl	0,025 %iger HCl	0,01 %iger HCl
Ausbeute in %	51,62	58,58	59,25	60,63
	In % der Trockensubstanz			
Asche	0,89	0,87	0,60	0,70
Pentosan	1,95	3,60	9,20	16,98
α-Cellulose	81,84	82,96	77,24	78,26
Roe-Wert	5,85	8,51	9,85	10,46
Kupfer-Zahl	5,21	6,18	2,96	4,26

Wir haben ferner die Aufschlußversuche mit einer 2 %iger NaOH-Lösung ausgeführt (Tabelle XI).

Tabelle XI.

Vorbehandelt mit	0,1 %iger HCl	0,05 %iger HCl	0,025 %iger HCl	0,01 %iger HCl
Ausbeute in %	43,49	46,13	52,12	55,28
	In % der Trockensubstanz			
Asche	1,47	1,56	1,07	0,93
Pentosan	2,15	3,52	8,88	17,74
α-Cellulose	92,01	93,93	88,51	80,36
Roe-Wert	3,47	3,07	3,19	2,57
Kupfer-Zahl	1,12	0,66	1,82	1,01

Zur Bleichung wurde eine 5 %ige Zellstoffsuspension mit einer Bleichpulverlosung bei 40° behandelt (Tabelle XII).

Tabelle XII.

Vorbehandelt mit	Asche	Pentosan	α-Cellulose	Kupfer-Zahl	Viskozität
0,05 %iger HCl	1,15	9,55	92,96	1,06	29
0,01 %iger HCl	0,99	22,71	82,60	1,29	22

SCHRIFTTUM.

(1) Hirata, Honda, Nakamura u. Yamafuji; diese Zs., **16**, 33 (1940)

(2) Honda, Tatsuno, Nakamura, Goda, Mima u. Yamafuji; diese Zs., **16**, 49 (1940)

ABSTRACTS
from
TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

On Xylitol. (2).

On Xylitolanhydride (Xylitan).

(pp. 581~584)

By T. YABUTA, K. ASO, S. KIMOTO, and K. MIWA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received July 8, 1941.)

Studies on the Mucilage from Rhodophyceae. IV.

The Chemical Structure of the Sulfuric Acid Group Split of Mucilage from Chondrus Ocellatus Holmes.

(pp. 585~592)

By T. MORI and Y. TUTIYA.

(Tokyo Imperial University; Received June 9, 1941.)

Studies on Red Yeast. 1. *Sporobolomyces* nov. sp.

(Report 2) Provitamin A Content in the Yeast *Sporobolomyces* nov. sp.

(pp. 593~598)

By Izue YAMASAKI and Seizi MORISITA.

(Agricultural Chemical Institute, Kyūshū Imperial University, Hukuoka;
Received June 21, 1941.)

According to the biological test for vitamin A, the dried yeast cured xerophthalmia of rats, and proved to be sufficient for the normal growth of the test animals at the daily dose of 80~100 mg per head.

Therefore, contrary to the reports of previous workers(1)(2), the yeast *Sporobolomyces* contains provitamin A as do red Torula yeasts(2)(3)(4).

Thanks are due to the Department of Education for a Scientific Research Encouragement Grant.

(1) A. Guilliermond: Bull. Inst. Pasteur., Vol. 26, 722 (1928).
(2) E. Lederer: C. r., 197, 1694 (1933); C. r., Soc. Biol., 117, 1083 (1934); Bull. Soc. Chim. Biol., 20, 611 (1938).
(3) C. Fromajoet and J. L. Tchang: Arch. f. Microbiol., 9, 424 (1938).
(4) J. L. Tchang and P. Chaix: Bull. Soc. Chim. Biol., 20, 1175 (1938).

On the Metabolism of Organic Acids by Bacteria. IV.

(pp. 599～602)

By S. TADA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received June 12, 1941.)

Die Konstitution eines neuen, aus der Stärke isolierten Disaccharids und die daraus gezogene Betrachtung über den Aufbau des Stärkemoleküls.

(SS. 603～612)

Yukihiko NAKAMURA.

(Institut für Landwirtschaftliche Chemie, Landwirtschaftliche Fakultät der Kaiserlichen Hokkaido Universität;
Eingegangen am 2. 7. 1941.)

Die Isolierung und der Beweis einer 1,3-Bindung aus der Stärke ist für die Chemie der Stärke sehr wichtig, weil dadurch die Konstitution des Stärkemoleküls ganz klar erwiesen werden kann. Die Untersuchungen in dieser Richtung sind zum Fortschritt der Chemie der Stärke unbedingt nötig.

Durch die Hydrolyse der Stärke mit Diastase entsteht ein neues Disaccharid. Der Verfasser isoliert das Disaccharid als Osazon. Der Schmelzpunkt des Osazons ist 160～162° und das Drehungsvermögen ist $[\alpha]_D^{15^\circ} = +59{,}28^\circ \rightarrow +46{,}39^\circ$ (CH_3OH, $c=1{,}164\%$).

Der Verfasser beweist experimentell, daß das Disaccharid eine 1,3-Bindung hat, und daß seine Konstitution 3-[*α*-*d*-glucosido<1,5>]-*d*-glucose<1,5> ist.

Der Verfasser nennt das Disaccharid „*Amylolyose*.“

Die Amylolyose läßt genau erkennen, daß auch die 1,3-Bindung als die Verzweigungsstelle im Stärkemolekül vorhanden ist. Und zwar muß das Stärkemolekül hauptsächlich durch 1,4-Bindungen geradlinig lang und daneben durch 1,3- und 1,6-Bindungen verzweigt verbunden sein.

Functional Studies on Soil. (XXIX～XXXI).

(pp. 613～618)

By Hideo MISU.

(Agricultural Experiment Station, Government General of Tyosen; Received May 13. 1941,)

Studies on Methionine and its Derivatives. (III).

On the Formation of γ-Methylmercapto-propyl-amine and γ-Methylmercapto-propyl-alcohol from Methionine.

(pp. 619～622)

By Yoshio TSUCHIYA.

(S. Suzuki and Co., Ltd.; Received May 17, 1941.)

γ-Methylmercapto-propyl-amine was prepared by the decarboxylation of methionine at 250°, using liquid paraffine as " Warme Übertrager." γ-Methylmercapto-propyl-alcohol (methionol) was subsequently derived from the amine by the action of nitrous acid. The yield of the amine and the alcohol was 56.7 and 29.4 %, respectively.

Researches on Bamboo in Taiwan as a Raw Material for Pulp. Part VI.

On the Sulphate Pulp of " Keitiku."

(pp. 623～626)

By Minoru TUTIYA and Yoshiteru KATO.

(Industrial Research Institute of Taityu; Received July 11, 1941.)

We investigated sulphate method to obtain bleachable pulp from 3 years old " Keitiku," and intended to obtain the optimum ratio of sodium sulphide to caustic soda, maintaining the total titrable alkali constant. As a control, we tried pulping with caustic soda and sodium sulphite separately.

We obtained the following results:—

1. The existence of sulphide is more effective for pulping than caustic soda only, and pulping is possible using sulphide alone.
2. From the data of yields, chlorin consumption and chemical analysis of pulps, the optimum, ratio $Na_2S/NaOH$ would be 0.6, and the total titrable alkali 21% (for dried substance).
3. The yield of bleached pulp was poor, about 32%, but the lignin in an

unbleached pulp was 2.9% and this was easily bleached by chlorin water, NaOH treatment and bleaching powder liquid.

4. Cu-index and relative viscosity suggested the small degree of the destruction of cellulose.

5. The "α-cellulose" content in bleached pulp was 90%, but it had 20% of pentosan, owing to which the pulp would not be preferable for artificial silk pulp.

6. The yield of bleached pulp was lower than that in Magnesium sulphite method.

Studies on a Lactogenic Factor in Soy-beans.

IV. Chemical studies of the crystals isolated from the lactogenic alcohol extract.

V. The effect of the isolated crystals on the lactation in the guinea pigs.

(pp. 627～636)

By Yosaburo Iwasa.

(Dept. of Food Chemistry, Osaka Municipal Hyg. Lab.; Received July 14, 1941.)

Studies on Bios. Part IV.

Effect of Pantothenic Acid, Vitamin B_1, B_6, Nicotinic Acid, *p*-Aminobenbenzoic Acid and Mesoinositol on a few strains of Sacchromyces Cerevisiae.

(pp. 637～640)

By Nobusada Okoti.

(Agricultural Chemical Labolatory, Faculty of Agriculture, Tokyo Imperial University; Received July 21, 1941.)

On the Stimulant for Cane Sugar Formation in Plants. (IX).

(pp. 641～643)

By Tetutaro Tadokoro, Yoshio Makino and Keizo Ito.

(Hokkaido Imperial University; Received June 23, 1941.)

On the Biochemical Properties of the Rice Embryo. (1st Report).

(pp. 644~646)

By Tetutaro TADOKORO, Tuneyuki SAITO, and Jizo HASHIMOTO.

(Hokkaido *Imperial University; Received July 3, 1941.)*

On the Purification of Tyrosine.

(pp. 647~651)

By Yoshio TSUCHIYA.

(S. Suzuki and Co., Ltd.; Received May 17, 1941.)

Utilization of Alcoholic Distillation Waste.

(pp. 652~654)

By Wasaburo MOGI and Takeo NAGATOMO.

(Chemical Laboratory, Noda Syoyu Co. Ltd.; Received July 29, 1941).

Acid Saccharification of Mulberry Branches and Alcoholic Fermentation of the Saccharified Solution.

(pp. 655~672)

By T. YABUTA and T. TATUMI.

(Tokyo Imperial University; Received July 24, 1941.)

Biochemical Studies of "Bakanae" Fungus.

Part 9. Chemical Constituents of the Fungus. I.

(pp. 673~676)

By T. YABUTA, Y. SUMIKI, T. TAMURA, and N. MURAYAMA.

(Tokyo Imperial University; Received June 23, 1941.)

Vol. 17 September 1941 No. 9

Bulletin of the Agricultural Chemical Society of Japan.

TRANSACTIONS

Über das Pentosan des Zuckerrohrs.

Von T. TATSUNO, F. NISHIO, S. AOKI
und K. YAMAFUJI.

(Aus dem Institut fur Zuckerforschung in Tainan)

Eingegangen am 24. 4. 1941.

Der Zuckerrohrstengel enthalt eine ziemlich grosse Menge von Pentosan. In der vorliegenden Abhandlung werden die Ergebnisse der Versuche über den Pentosangehalt der Bagasse, die Isolierung des Furfurols und die Herstellung des Furfurolharzes mitgeteilt.

1. PENTOSANGEHALT DER BAGASSE.

Die in der Fabrik ausgepreßte Bagasse wurde mit Hilfe einer Reihe von Sieben mit verschiedenen Lochergrößen gesiebt. Die chemische Zusammensetzung der einzelnen Teile ist folgende (Tabelle I).

Tabelle I.

Lochergrösse des Siebes in mm	> 2	2—0,75	0,75—0,3	0,3—0,15	< 0,15
	In % der Trockensubstanz				
Asche	1,31	3,11	4,97	5,56	12,38
Kaltes Wasser-Extrakt	0,06	0,13	0,37	0,50	1,52
Heisses Wasser-Extrakt	1,36	1,82	2,68	4,48	4,80
Verd. Alkali-Extrakt	29,52	31,67	35,24	37,89	40,19
Alkohol-Benzol-Extrakt	1,74	2,36	2,57	2,89	3,27
Lignin	21,14	21,11	21,61	22,06	22,10
Pentosan	30,62	29,35	28,26	27,12	26,38
Cellulose	58,50	53,11	48,82	46,59	42,94
α-Cellulose	41,25	37,17	33,85	31,94	29,10

2. ISOLIERUNG DES FURFUROLS.

10 g Bagasse wurden mit Schwefelsaure oder Phosphorsaure unter Zusatz von

Katalysatoren in einem Hochdruckkessel auf 3 Atm. erhitzt und das entstandene Furfurol wurde nach 1, 3 oder 5 Stunden bestimmt (Tabellen II bis V).

Tabelle II.

Hydrolysiert mit Schwefelsaure. Erhitzungsdauer: 1 Stunde.

Katalysator	Säurekonzentration in %	Ausbeute in g	Verhältnis der Ausbeute	Pentosan im Rückstand in %
1,5 g $AlCl_3$	5,0	0,101	112	0,36
1,5 g NaCl	″	0,108	119	0,43
1,5 g Na_2HPO_4	″	0,100	111	0,66
—	″	0,090	100	0,73
1 0 g $AlCl_3$	2,5	0,083	122	1,33
1,0 g NaCl	″	0 076	113	1,06
1,0 g Na_3HPO_4	″	0,063	93	1,55
—	″	0,068	100	1,31
1,0 g $AlCl_3$	1,0	0,083	193	1,60
1,0 g NaCl		0,043	99	1,60
1,0 g Na_2HPO_4	″	0 039	90	2,68
—	″	0 043	100	1,73
1,0 g $AlCl_3$	0,5	0,090	264	4,45
1,0 g NaCl	″	0,066	194	6,33
1,0 g Na_2HPO_4	″	0 024	70	6,40
	″	0 034	100	4,58

Tabelle III.

Hydrolysiert mit Schwefelsaure. Erhitzungsdauer: 3 Stunden.

Katalysator	Säurekonzentration in %	Ausbeute in g	Verhältnis der Ausbeute	Pentosan im Rückstand in %
1,5 g $AlCl_3$	2,5	0,085	116	0,51
1,5 g NaCl	″	0,082	112	0,53
1,5 g Na_2HPO_4	″	0,065	89	0,92
—	″	0,073	100	0,61
1,5 g $AlCl_3$	1,0	0,096	172	0,68
1,5 g NaCl	″	0,067	117	1,00
1,5 g Na_2HPO_4	″	0,051	89	1,27
	″	0,057	100	1,05
1,0 g $AlCl_3$	0,5	0,102	208	1,02
1,0 g NaCl	″	0,053	108	1,88
1,0 g Na_2HPO_3	″	0,025	51	6,61
—	″	0,049	100	2,42

Tabelle IV.

Hydrolysiert mit Phosphorsaure. Erhitzungsdauer: 3 Stunden.

Katalysator	Säurekonzentration in %	Ausbeute in g	Verhältnis der Ausbeute	Pentosan im Rückstand in g
1,5 g $AlCl_3$	2,5	0,086	158	0,65
1,5 g NaCl	"	0,060	116	2,06
–	"	0,055	100	2,42
1,5 g $AlCl_3$	1,0	0,079	203	0,90
1,5 g NaCl	"	0,053	138	3,09
-	"	0,039	100	4,41
1,0 g $AlCl_3$	0,5	0,063	171	2,66
1,0 g NaCl	"	0,032	89	6,38
-	"	0,037	100	6,88

Tabelle V.

Hydrolysiert mit Phosphorsaure. Erhitzungsdauer: 5 Stunden.

Katalysator	Säurekonzentration in %	Ausbeute in g	Verhältnis der Ausbeute	Pentosan im Ruckstand in g
1,5 g $AlCl_3$	2,5	0,070	125	1,24
1,5 g NaCl	"	0,047	85	1,79
–	"	0,056	100	1,98
1,5 g $AlCl_3$	1,0	0,067	158	1,23
1,5 g NaCl	"	0,041	97	3,06
	"	0,042	100	3,72
1,5 g $AlCl_3$	0,5	0,066	200	1,77
1,5 g NaCl	"	0,032	98	4,23
–	"	0,033	100	6,17

Die Bagasse wird durch Schwefelsaure viel besser hydrolysiert, als durch Phosphorsaure. Unter den drei Katalysatoren ubt das Aluminiumchlorid auf die Zersetzung des Pentosans die starkste beschleunigende Wirkung aus.

3. Herstellung des Furfurolharzes.

Die Bagasse wurde mit verschiedenen Mengen von Salzsaure und Phenol versetzt. Nach dem Erhitzen wurde dann die Mischung gepreßt. Einige Beispiele sind in Tabelle VI enthalten.

Tabelle VI.

Versuch	Bagasse in g	Salzsäure in cc	Phenol in g	Ausbeute in g	Temperatur bei der Pressung in °C	Zugfestigkeit des Harzes in kg/cm^2
26	100	30	30	69,3	155	79
75	100	3	15	70,0	135	145

80	100	12	15	74,5	140	92
89	100	3	25	71,0	155	185
93	100	1	15	78,0	170	155
95	100	2	15	69,5	163	252
104	100	2	15	80,5	136	216
109	100	2	15	81,0	153	167

Im allgemeinen ist die Zugfestigkeit der aus Bagasse hergestellten Furfurolharze etwas kleiner als diejenige der Bakeliten. Die Produktionskosten der Furfurolharze sind verhältnismässig gering, wenn sie in der obenerwähnten Weise direkt aus der Bagasse hergestellt werden.

ABSTRACTS
from
TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Enzymatic Studies on Cereals. (Part XIII).

On the Change of the Amylase Action During the Ripening of Rice.

(pp. 677~680)

By Gohei YAMAGISI.

(Morioka Imperial College of Agriculture and Forestry;
Received August 11, 1941.)

In the previous papers of this series the author has declared that in the ungerminated rice-seeds there was in existence the water-insoluble zymogen amylase, which, at the germination, was decreased whereas the water-soluble amylase was increased.

Based on this fact, we are lead to suppose that during the ripening of rice the phenomena reverse to that of the germination may occur.

It is the purpose of this investigation to confirm whether this deduction is right or not, and the following results were obtained:

In the early stage of ripening the water-soluble amylase was most abundant, but afterwards that activity appeared to decrease gradually. The salt-soluble form of amylase, on the contrary, was increased as maturity advanced.

Of all amylases, this was so in the case of the saccharifying enzyme.

Thus, the author wants to claim that in the course of the ripening of the rice-seeds some parts, at least, of the amylase are converted into an inactive zymogen form.

On Xylitol. (3).

Physical Properties of Xylitol.

(pp. 681~684)

By T. YABUTA, K. ASO, S. KIMOTO, and K. MIWA.

(Agricultural Chemical Labolratoly, Tokyo Imperial University;
Received July 8, 1941,)

Studies on "Tosetu," a Soy-bean Preparation. I.

On the Changes of Composition of Tosetu during its Manufacture and Storage.

(pp. 685～690)

By K. KATAI and B. KITAHARA.

(Department of Agriculture, Kyūshū Imp. University and Nippon Yusi Kabusiki Kaisya;
Received August 11, 1941.)

Ascorbic Acid Content of Dried Peel, Canned Fruit and Juice of Satsuma Orange (Mandarin orange).

(pp. 691～696)

By Yasuo IWASAKI and Toshio KOMATSU.

(Institute of Rural Industry, Department of Agriculture and Forestry;
Received August 6, 1941.)

Studies on Red Yeast. 1. *Sporobolomyces* nov. sp.

(Report 3) Carotenoid Pigments in the Red Yeast *Sporobolomyces* nov. sp.

(pp. 697～705)

By Izue YAMASAKI, Seizi MORISITA, and
Motomasa KAKEI.

(Agricultural Chemical Institute, Kyushū Imperial University, Hukuoka;
Received August 11, 1941.)

The red color of the yeast *Sporobolomyces* is due to at least 7 pigments, separable by partition between different solvents and by chromatographic adsorption method.

Six of the pigments are neutral, one acidic.

In quantitative determination of three most abundant pigments, the yeast contains 23 γ β-carotin, 92 γ torulin, 41.7 mg of acidic pigment in 1 g dried yeast.

Of these, 12 γ β-carotin was utilized as provitamin A by rats, 50 γ torulin and 100 γ of acidic pigment were useless.

Therefore it is confirmed that the yeast *Spolobolomyces*, contrary to the reports of previous authors, contains pro-vitamin A as does the red torula yeast.

Thanks are due to the Department of Education for a Scientific Research Encouragement Grant.

On the Synthesis of Aspartic Acid.

(pp. 606～710)

By Yoshio TSUCHIYA.

(S. Suzuki and Co., Ltd.; Received May 17, 1941.)

The present author has prepared aspartic acid from fumaric acid (1 mol.), ammonia (2 mol.) and ammonium chloride (4 mol.), by heating this mixture in autoclave (180°, 10 Atm.) for 1 hour.

The yield of this amino acid was 60～65%. A further 10% of aspartic acid was obtained from residual solution, which was obtained after the aspartic acid had been separated from the above reaction mixture by a similar treatment to that above mentioned.

Functional Studies on Soil. (XXXII～XXXVII).

(pp. 711～720)

By Hideo MISU.

(Agricultural Experiment Station, Government General of Tyosen; Received May 13, 1941.)

Biochemical Studies of "Bakanae" Fungus.

Part 10. The Chemical Constitution of Gibberellin. I.

(pp. 721～730)

By T. YABUTA, Y. SUMIKI, K. ASO, T. TAMURA, H. IGARASI, and K. TAMARI.

(Tokyo Imperial University; Received August 1, 1941.)

Zur Chemie des Muskeleiweisses.

II. Mitteilung. Aminosauregehalt des Kaninchenmuskeleiweisses.

(SS. 731～744)

Von M. KANDATU.

(Aus d. Agrikulturchem. Inst. d. Univers. Tokio, Japan: Eingegangen am 23. 6. 1941.)

Das Muskeleiweiss der hinteren Extremitaten von etwa zweikilogrammigen Kaninchen wurde dreimal mit Methanol digeriert, dann mit Äther extrahiert.

Von diesem gereinigten Muskeleiweiss wurde der Aminosäuregehalt nach der Brazier-Methode ermittelt.

Die Resultate sind folgende.

Aminosäure	% der trockenen Masse	Aminosäure	% der trockenen Masse
Glykokoll	4,2	Oxyglutaminsäure	1,5
Alanin	2,8	Tyrosin	*4,3
Valin	4,9		2,1
Leucin	12,0	Oxyprolin	0,2
Prolin	7,7	Arginin	6,9
Phenylalanin	1,8	Histidin	1,1
Asparaginsäure	1,9	Lysin	9,6
Glutaminsäure	16,4	Tryptophan	*1,8

* kalorimetrisch

Untersuchungen über das sogenannte „Gluconobacter.“ I. Mitteilung.

(SS. 745～762)

Von Teijirô UYEMURA und Keiji KONDÔ.

(Wissenschaftl. Laboratorium von Ch. Takeda & Co. Ltd., Osaka;
Eingegangen am 28. 4. 1941.)

Biochemische Untersuchungen über die Bildung von Pflanzenbestandteilen.

(SS. 763～770)

Von Yukihiko NAKAMURA und Tokuji SCHIMOMURA.

(Institut für Landwirtschaftliche Chemie, Landwirtschaftliche Fakultät der Kaiserlichen Hokkaido Universität:
Eingegangen am 8. August 1941.)

Was für Bestandteile werden auf der ersten Stufe des Pflanzenwachstums erzeugt ? Welche Beziehungen sind zwischen diesen Bestandteilen verschiedener Arten und dem weiteren Wachsen der Pflanzen vorhanden ? Sind die auf diese Weise erzeugten Materialien der Zusammensetzung genau mit den bei der Vollendung des Wachstums gefundenen identisch oder nicht ? Des weiteren wie steht es mit der Cellulose ? Um diese Fragen zu beantworten, haben die Verfasser die jetzigen Untersuchungen angestellt. Als Versuchsmaterial haben sie sehr junge Stengel von Rapsen (japanisch „Natane-Mojaschi“) gebraucht.

I. Mitteilung. Einer der Verfasser (Nakamura) hat folgende Ergebnisse beobachtet: Auch bei den auf der allerersten Stufe des Wachstums stehenden

Pflanzen wie „Natane-Mojaschi“ konnten mit Sicherheit α-Cellulose bestimmt werden und überdies neben dem großen Gehalt anorganischer Bestandteile auch stickstoffhaltige- und nichtstickstoffhaltige Verbindungen verschiedener Art, deren Polymerisationsgrade vielleicht kleiner zu sein scheinen, in großer Menge, und ferner konnten auch ätherlösliche Substanzen in kleineren Mengen mit jenen zusammen vorkommen, aber des kleineren Gehaltes der letzteren wegen konnte die von Hess, Sisson und anderen vorgelegte Arbeitshypothese wohl nicht angenommen werden.

Die chemischen und physikalischen Eigenschaften der isolierten α-Cellulose und auch die der sonstigen Verbindungen sind noch nicht klar, werden aber gegenwärtig von den Verfassern erforscht.

II. Mitteilung. Die Verfasser haben qualitative Versuche von einigen hauptsächlichen Enzymen, die zweifellos bei der Bildung der Pflanzenmaterialien, d. h. dem Wachstum die wichtigste Rolle spielen müssen, gemacht.

Invertase, Amylase als Carbohydrase, pepsinartige-, trypsinartige Enzyme und Erepsin als eiweißspaltende Enzyme, Glycerophosphatase und wahrscheinlich auch Lipase als Esterase wurden in dieser Prüfung nachgewiesen, und außerdem wurde zugleich einige Aufmerksamkeit dem Gebrauch des Stalagmometers bei Untersuchung der Lipasewirkung zugewendet.

Separation and Identification of Fatty Acids. Part 6.

Preparation of Pure Linoleic and Linolenic Acids by Means of Hydroxamic Acids Method.

(pp. 771~775)

By Y. INOUYE and H. YUKAWA.

(Biochemical Laboratory, Department of Agriculture, Kyoto Imperial University;
Received August 22, 1941.)

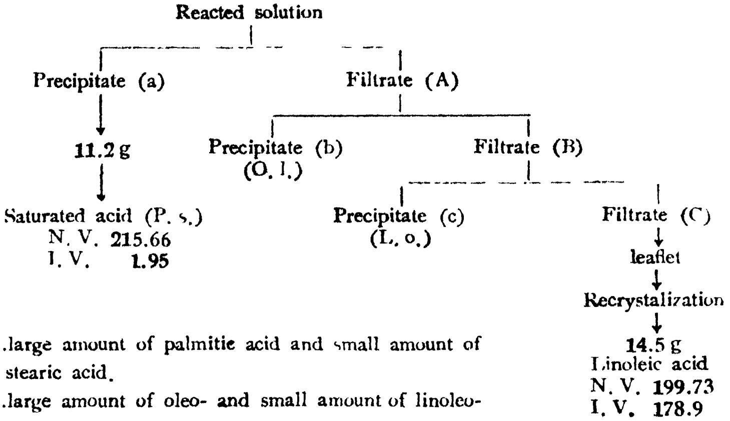
The bromination-debromination procedure has been universally used for the isolation of linoleic and linolenic acids because it is the only method which yields products which are pure as evaluated by iodine number. This procedure involves bromination of natural fatty acid mixtures, purification of the solid tetra- or hexabrmides, and removal of bromine with zinc. Rollett originally carried out the debromination reaction with zinc in boiling strongly acidified alcohol. Recently Brown and his coworkers have shown that linoleic and linolenic acids, prepared by the debromination procedure, contain about 12 and 15%, respectively, of isomeric acids which give nearly theoretical iodine numbers for C_{18}, although their repeated low temperature crystallization procedures for the isolation of these acids are, as they recognize, in a considerably less pure state than that which results from the debromination method.

The authors have studied the separation and identification of fatty acids as their hydroxamic acid derivatives which can be crystallized out and give acute melting points and from which free acids can be easily recovered by treating with mineral acid. This procedure should be remarked on the fact that, for the purpose of the separation of free pure acids, the chemical properties of double bond are not utilized at all, being different from the bromination-debromination procedure by which geometrical isomerizations have been discussed. The authors' process never comes in contact with double bonds in fatty acid molecule in the course of the preparation procedure, and consequently geometrical isomerizations at double bonds might be out of consideration.

The authors previously isolated crystalline linoleo- and linoleno-hydroxamic acids, the melting points being 41～42°C and 37～38°C respectively, from Rollett's linoleic and linolenic acids (This Journal, **16**, 510, 1940.). In the present work the authors studied the isolation of linoleic acid directly from cotton seed and soya bean oils and linolenic acid from linseed oil. As results, it was concluded that this method may be recommendable as one of preparation methods of the above pure acids, in better yield than that of the bromination method. And besides this, the authors believe these investigations would be of some significance to a further identification of naturally occurred or prepared geometrical isomeric acids of the above acids, though the present studies were limited in the sense of ordinary linoleic and linolenic acids.

44 g of cotton seed oil (saponification value, 190.66, mean mol. wt. 882.78, iodine value, 104.85) were treated two days at room temperature with 12.5 g of hydroxylamine hydrochloride and sodium ethylate (7.6 g as sodium), using alcohol as solvent, and then neutralized to congo red with alcoholic hydrochloric acid at 0°C. The process was tabulated as follows: The crystalline precipitates (a) were filtered off by suction and washed with ether and subsequently with water. 11.2 g (25% of the oil) were obtained as precipitates which were hydroxamic acid mixtures of saturated fatty acids. The filtrate (A) was evaporated to syrup in vacuum, after being neutralized with sodium acetate and carbonate, and then again slightly acidified with alcoholic-glacial acetic acid and diluted with cold water to about 1 litre, following extraction with ether. The ether solution (250 cc) was mixed with 100 cc of petroleum ether and cooled down to −5°C. The precipitate (b) obtained mainly consisted of oleohydroxamic acid, with a small amount of linoleohydroxamic acid (O. l.) and the filtrate (B), after being evaporated to 250 cc in vacuum, was mixed with 100 cc of petroleum ether and cooled to −5°C. Thus the precipitate (c) and the filtrate (C) were obtained. The (c) was almost leaflet crystal which was confirmed to be mainly linoleohydroxamic acid, accompanied with a little amount of oleohydroxamic acid (L. o.). The (C) was condensed to dryness under reduced pressure and recrystallized twice from petroleum ether, and 14.5 g of crystals (33% of the oil) were collected, the melting point being 41～42°C which was identified as the same as the linoleohydroxamic acid, previously prepared from the pure linoleic acid by the authors. And the free linoleic acid was quantitatively recovered by alcoholic sulphuric acid by the authors' usual

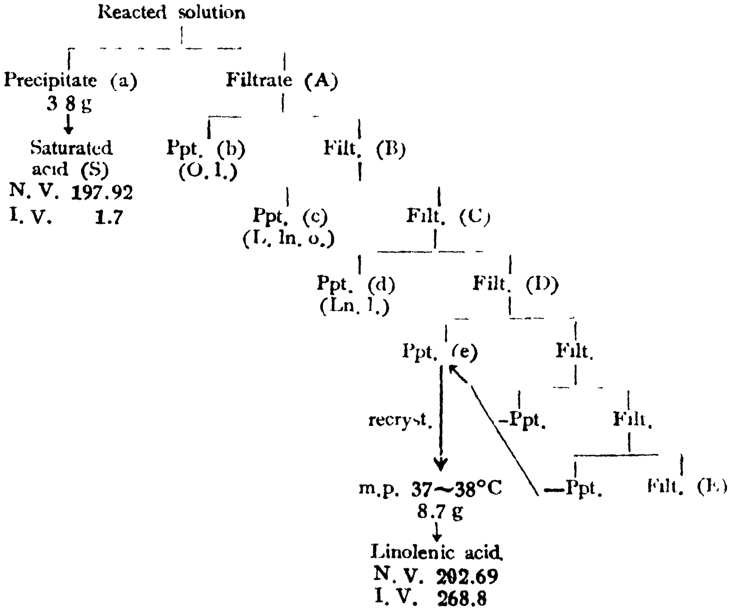
method. The neutralization value, 199.73 and the iodine value, 178.9 of the free acid were determined.



P. s. ......large amount of palmitic acid and small amount of stearic acid.
O. l. ......large amount of oleo- and small amount of linoleohydroxamic acid.
L. o. ......large amount of linoleo- and small amount of oleohydroxamic acid.

Almost the same result was obtained from soya bean oil (saponification value, 191.6, iodine value, 140.99). The yield of linoleohydroxamic acid to the oil was about 20%.

The same procedure was applied to linseed oil (saponification value 189.66, mean mol. wt. 886.50, iodine value, 178.3) for the isolation of pure linolenic acid.



S ....stearic acid
O. l. ....large amount of oleohydroxamic and small amount of linoleohydroxamic acid.
L. ln. o. ......large amount of linoleo- and small amount of linoleno- and oleohydroxamic acid.
Ln. l. ....large amount of linoleno- and small amount of linoleohydroxamic acid.

The schedule was tabulated as follows. 8.7 g of crystallized linolenohydroxamic acid (m.p. 37~38°C) were obtained from 44 g of linseed oil.

The cost of this research has been defrayed from the Scientific Research Expenditure of the Department of Education to the authors' sincere gratitude.

On the Chemical Studies of the Baggasse Pulp. (6).

(pp. 776~778)

By Tetutaro TADOKORO and Masao NISHIDA.

(Hokkaido Imperial University; Received July 29, 1941.)

Studies on the Components of the Bark of Rhamnus japonica (V).

The Position of the Free Hydroxyl-group of α-Sorinin.

(pp. 779~783)

By Zirô NIKUNI.

(Agr. Chem. Laboratory, Tokyo Imp. Univ.; Received August 26, 1941.)

As reported previously, α-sorinin is a primveroside of α-sorigenin(1). The latter is the lactone of *x*, *x*-dihydroxy-*x*-methoxy-3-hydroxymethyl-2-naphthoic acid(2). There is a wide difference between the characters of the two hydroxyl-groups of α-sorigenin. Namely, the one shows characteristic greenish colour with ferric chloride solution and is methylated very easily by diazomethane. But the other shows no colour reaction with ferric chloride solution and is methylated with difficulty.

To determine which hydroxyl-group may be present in free state when it is the glycoside, α-sorinin (the glycoside) was methylated with diazomethane and then hydrolysed with dilute sulphuric acid. The resulting aglycone shows no colour reaction with ferric chloride solution and is identical with the monomethyl-α-sorigenin(1) obtained from α-sorigenin by methylation with diazomethane. It melts at 196~197°. So it is evident that the new methoxyl-group of monomethyl-α-sorigenin corresponds to the free hydroxyl-group of the glycoside.

On oxidation of α-sorigenin and its derivatives by potassium permanganate, the following results are obtained.

(1) From α-sorigenin scarcely any oxidation products were obtained. It means that the two hydroxyl-groups are divided to different rings of the naphthalene nucleus.

(2) From monomethyl-α-sorigenin faint yellowish prisms (m.p. 250~251°) are obtained. From the analytical results, acidity and absorptionspectrum it is determined as monomethoxy-pyromellithic acid, which is a new compound.

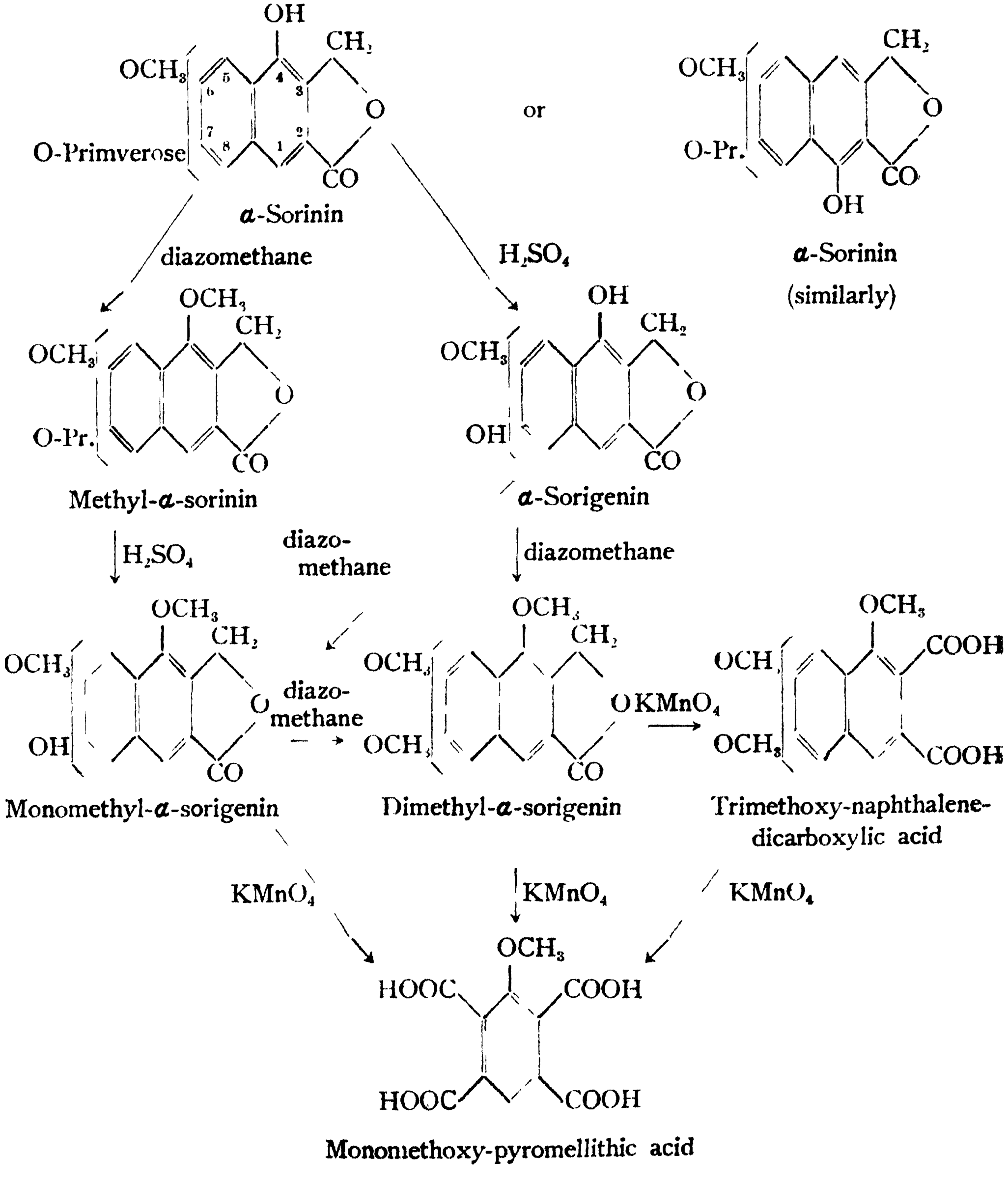
Analytical results :

	C%	H%	OCH_3%
Observed	46.90	3.50	12.43
Calculated as $C_{11}H_8O_9$	46.46	2.83	10.92

Acidity (titrated with 0.1 *N* HaOH solution by microburette)

	NaOH
Sample 3.992 mg	2.286 mg
Calculated as $CH_3O \cdot C_6H(COOH)_4$	2.249 mg

Thus it is clear that the new methoxyl-group of the monomethyl-*α*-sorigenin is present at the centre ring of the compound.



(3) From dimethyl-α-sorigenin and trimethoxy-naphthalene-dicarboxylic acid(3), monomethoxy-pyromellithic acid is also obtained, showing that the left side ring of these compounds is less stable than the centre ring.

α-Sorinin is therefore the lactone of x-primverosido-x-methoxyl-1 or 4-hydroxy-3-hydroxymethyl-2-naphthoic acid.

The results are indicated as the figures (page 93):

In conclusion the author desires to express his sincere thanks to Prof. Bunsuke Suzuki for his kind guidance throughout this work, and to the Imperial Academy for a grant, which has in part defrayed the cost of this investigation.

LITERATURE.

(1) Nikuni: Bull. Agr. Chem. Soc. of Japan, **14**, 25 (1938); C. **1938**, II, 77.
(2) Nikuni: ibid, **15**, 43 (1939); C. **1939**, II, **1292**.
(3) Nikuni and Hayashi: ibid., **15**, 158 (1939); C. **1940**, I, 1996.

Über die Bestandteile der japanischen Mistel.

III. Mitteilung. Oleanolsäure, zwei Harzalkohole (β-Amyrin u. Lupeol) in den Blättern.

(SS. 784～786)

Von Yataro OBATA.

(Biochemiches Institut der Landwirtschaftlichen Fakultät, Universität Tokio:
Eingegangen am 22. 8. 1941.)

ABSTRACTS

from

TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

On the Forest Soil Type in North-Eastern Manchuria.

(pp. 787～793)

By R. KAWASHIMA, S. TANAKA, and G. TOYAMA.

(Agricultural Chemical Laboratory, Kyushu Imperial University;
Received September 2, 1941.)

Studies on Crystalline Catalase. (I).

On the Isolation of Crystalline Catalase from Beef Liver.

(pp. 794～796)

By Matsunosuke KITAGAWA and Masaharu SIRAKAWA.

(Agricultural Chemical Laboratory, Kyushu Imperial University;
Received September 8, 1941.)

The crystalline catalase was obtained from beef liver by our acetone method, which had been rejected by Sumner and Dounce(1).

The fresh extract of the ground beef liver is treated twice with 0.8 volume of acetone and then is precipitated with 0.4 saturated ammonium sulfate. Dissolving the precipitate in concentrated solution and allowing it to stand at about 5° for two days, the catalase is crystallized in the needle form.

The catalase activity, "Kat. f.", was determined, the value of which was 25,500.

(1) J. B. Sumner and A. L. Dounce: J. Biol. Chem., **121**, 417 (1937).

The Determination of Carbonic Acid. (II).

(pp. 797～800)

By Yosaburo IWASA and Kunitaro IWAMOTO.

(Dept. of Food Chemistry, Osaka Municipal Hyg. Lab.;
Received September 1, 1941)

Studies on Vitamins of Fish Livers. (Part III).

Relation Between Vitamin A Content and Characteristics of Liver Oil.

(pp. 801～813)

By Hideo HIGASHI.

(Imperial Fisheries Experimental Station, Tokyo, Japan;
Received August 30, 1941.)

(I) Relation between vitamin A content and refractive index (or iodine value) of liver oil.

The author's experimental results are as follows:—

TABLE I.

Species	Oil Content of Liver (%)	C. L. O. U.	Refractive Index
Squalus suckleyi	—	24.5	1.4699
	—	24.5	1.4695
	—	21.0	1.4697
	—	21.0	1.4696
	—	21.0	1.4694
	—	21.0	1.4691
	—	21.0	1.4687
	—	3.5	1.4690
	—	3.0	1.4680
	53.4	0.98	1.4675
	53.4	0.70	1.4679
Cynias manazo	41.2	2.6	1.4810
	29.4	2.6	1.4752
	30.9	0.5	1.4803
	13.2	0.3	1.4752
	30.0	0.15	1.4780
	47.1	0.1	1.4760
	43.2	0.1	1.4752
	50.8	0.1	1.4738
Prionace glausa	30.2	1.75	1.4722
	66.5	0.65	1.4699
Lamna cornubica	75.0	4.87	1.4732
	13.8	4.20	1.4741
	13.8	2.60	1.4758
	85.0	0.30	1.4760
	33.8	21.0	1.4729
	33.8	0.42	1.4750
Scoliodon walbeemi	46.6	0.44	1.4691
	42.4	0.06	1.4710
Sphyrna zygaena	—	126	1.4759
	—	90	1.4799
Pseudotriakis acreges	35.54	0.62	1.4656
	35.54	0.62	1.4660
Oncorhynchus masou	2.61	20.0	1.4802
Oncorhynchus keta	2.66	24.4	1.4774
Oncorhynchus kisutch	1.96	30.2	1.4824
Oncorhynchus tschawytscha	3.06	97.5	1.4771
Oncorhynchus nerka	2.12	100.0	1.4826
Zeus japonicus	9.20	12.6	1.4683
	25.6	2.6	1.4688
	45.7	0.44	1.4724
	17.9	3.72	1.4703
	23.8	0.7	1.4712
Scomber japonicus	4.69	90	1.4719
	4.52	30	1.4815
	3.36	24	1.4788
	1.04	22.5	1.4788
	12.2	15	1.4796
	20.7	15	1.4722
	16.0	13	1.4740
	6.26	12.6	1.4824

Thunnus orientalis	14.9	218.6	1.4826
	10.0	203.0	1.4776
	13.5	65.0	1.4728
	—	33.6	1.4793
	—	28.0	1.4757
	—	14 6	1.4752
	6.1	12.6	1.4835
Germo germo	2.16	92.5	1.4935
	12.9	24.4	1.4670
Neothunnus macropterus	3.36	420	1.4814
	3.50	220	1.4660
	36.7	105	1.4771
	2.32	840	1.5008
	3.05	700	1.5039
	2.38	420	1.4919
	2.18	245	1.4920
	3 37	240	1.4891
	2.63	210	1 4899
	1.92	175	1.4848
	2.04	147	1 4872
	3.02	126	1.4794
	3.24	105	1.4771
Katsuwonus vagans	3.43	28.4	1.4890
	3 53	24.4	1.4890
	2 55	15.6	1.4813
	5.16	12.1	1.4723
	1.03	97.5	1 4820
	5.9	97.5	1.4750
	3.20	48.7	1.4803
	4 29	49.0	1.4872
	1.50	35.0	1.4789
	3.25	30.0	1.4868
	4.57	24.5	1.4775
	4.19	10.5	1.4812
	5.76	3.0	1.4755
	15.43	2.6	1.4719
	15.42	2.6	1.4709
Pumpus argenteus	8.74	0.1	1.4692
	9.9	0.1	1.4652
Xiphias gladius	5.30	1000	1.4960
	1.37	490	1.4894
	9.9	450	1.4783
	5.88	450	1.4783
	3.1	91	1.4822

Xiphias gladius	28.5	30	1.4740
Corypaena hippurus	8.18	2.8	1.4662
	18.7	1.3	1.4563
Brama raii	2 55	310	1.4890
	4.00	210	1 4947
	3.71	210	1.4915
	4.76	210	1.4828
	4.06	150	1.4858
	4.37	126	1.4897
	4.21	120	1.4858
Sebastodes flammeus	25.0	20.3	1.4732
	30.8	72	1.4702
	35.3	48.7	1.4713
	53.9	21.8	1 4661
Sebastodes iracundus	15.3	2880	1.5154
	15.4	1700	1.4996
	11.3	1450	1.4914
	16.2	975	1.4872
	21.0	975	1.4870
	15.5	974	1.4910
	30.8	875	1.4822
	13.2	812	1.4841
	7.5	811	1.4825
	4.1	720	1.4890
	4.7	720	1.4837
	6.0	650	1.4868
	27.5	569	1 4759
	16.9	568	1.4794
	22.7	568	1.4800
	16.9	568	1.4785
	21.8	568	1.4780
	8.32	487	1.4835
	17.8	406	1.4793
	15.4	406	1.4735
	20.7	244	1.4745
	19.0	169	1 4741
	34.8	145	1.4690
	32.8	130	1.4698
	46.2	130	1.4670
	22.8	130	1.4667
	32.9	114	1.4710
	33.3	97.5	1.4700
	17.8	90	1.4708
	29.5	56.8	1.4700
	29.5	48.7	1.4700

Sebastodes iracundus	24.9	48.7	1.4688
	52.6	34.8	1.4665
	58.5	17.4	1.4659
Paralichthys olivaceus	15.7	62	1.4860
	27.7	42	1.4860
	4.4	24.5	1.4762
	12.5	12.6	1.4880
	4.37	9.8	1 4805
Kreius bicoloratus	15.0	7.0	1.4762
	30.2	1.3	1.4723
	25.7	0.6	1.4738
Gadus macrocephalus	—	14.8	1.4710
	—	14.3	1.4715
	—	13.9	1.4710
	—	3.0	1.4750
	—	2.6	1.4752
	—	3.0	1.4730
	—	13.5	—
Theragra chalcogramma	—	17.5	—
	34.86	12.6	1.4719
	34.9	12.6	1.4710
Brama rail	2.72	105	1 4828
	2.52	104	1.4844
Seriola quinqueradiata	2.95	490	1.4860
	1.92	336	1.4910
	2.68	240	1.4835
	6.50	210	1.4799
	2.46	120	1.4815
	5.35	60	1.4742
	13.3	42	1.4758
Niphon spinosus	26.8	117	1.4830
	18.8	14.7	1:4680
Epinephelus paecilonotus	7.26	105	1.4750
	5.88	42	1.4728
	3.8	11	1.4725
Stereolepsis ischinagi	24.8	1380	1.4946
	10.5	1050	1.4740
	14.7	840	1.4940
Stereolepsis ischinagi	16.3	284	1.4790
	19.2	203	1.4760
Etelis carbunculus	7.0	600	1.4915
	5.18	600	1.4912
	5.7	600	1.4815
Pristipomoides sieboldi	5.26	1260	1.5061
	20.1	175	1.4769
Nibea mitsukuri	7.9	62	1.4710
	9.14	44	1.4658
	22,3	146	1.4652
Sebastodes inermis	14.0	19.5	1.4660
	23.3	12.2	1.4698
	23.9	10.4	1.4683
Sebastodes baramenuke	16.31	36.0	1.4787
	14.45	194	1.4743
	21.48	174	1.4750
	21.9	174	1.4742
	18.48	114	1.4784
	23.14	72	1.4793
Sebastodes flammeus	8.3	2240	1.5092
	17.4	975	1.4856
	21.1	582	1.4835
	25.4	568	1.4841
	25.4	568	1.4830
	10 4	487	1.4847
	19.6	487	1.4792
	17.2	487	1.4817
	13.1	406	1.4850
	20.1	405	1.4791
	18.7	325	1 4770
	17.3	325	1.4757
	22.9	284	1.4720
	20.6	244	1.4751
	18.3	244	1.4749
	22.9	244	1.4740
	23.8	243	1.4733
	23.9	216	1.4713
	26.8	204	1.4724

As the refractive index of vitamin A is especially high, the oils extremely rich in vitamin A show high values of refractive index. (Table 1)

(II) Relation between vitamin A content and unsaponifiable matter of liver oil.

The author's experimental results are as follows:

TABLE II.

Species	No. of Sample	Oil Content of Liver (%)	C.L.O.U. of Liver Oil	Unsaponifiable Matter in Liver Oil (%)	Unsaponifiable Matter in Liver (%)	Stereol in Unsaponifiable Matter (%)	Stereol in Liver Oil (%)	Stereol in Liver (%)	R. I. of U. M.	I. V. of U. M.
Thunus orientalis	1	14.9	218.6	9.36	1.395					
	2	13.5	65.0	4.95	0.668					
	1	19.2	203	7.36	1.413					
	2	16.3	284	6.87	1.120					
Balaenoptera physalus	1	4.21	336	19.0	0.800					
	2	3.61	361	13.5	0.487					
	3	1.98	198	12.6	0.249					
Sebastodes iracundus	1	15.3	2880	34.1	5.22	8.03	2.738	0.419		
	2	21.0	975	19.2	4.04	21.7	4.166	0.875		
	3	15.5	975	19.7	3.05	16.0	3.152	0.489	1.5525	244.8
	4	30.8	875	12.6	3.88	20.5	2.583	9.796		
	5	8.32	487	12.3	1.09	20.5	2.522	0.210		
	6	25.4	406	6.64	1.689	23.4	1.554	0.395	1.5240	171.2
	7	17.8	406	9.1	1.62	26.7	2.430	0.433		
	8	32.8	130	5.01	1.643	34.4	1.754	0.575	1.5025	125.6
	9	21.2	130	4·08	0.865	40.8	1.665	0.353	1.5165	142.7
	10	22.8	114	5.34	1.218	53.0	2.830	0.644	1.4952	126.4
	11	24.9	48.7	4.55	1.133	52.8	2.402	0.599	1.4795	114.5
	12	58.5	17.4	4.06	2.375	45.7	1.855	1.085	1.4877	
Sebastodes flammeus	1	11.4	975	17.4	1.985	19.3	3.358	0.383	1.5634	238.8
	2	13.4	582	13.0	1.742	23.8	3 094	0.415		
	3	10.4	487	14.3	1.487	30.5	4.362	0.454		
	4	19.6	487	11.2	2.195	32.5	3.640	0.713	1.5255	198.9
	5	17.2	444	11.3	1.944	28.3	3.198	0.549		
	6	20.6	244	10.7	2.204	31.2	3.338	0.688		
	7	18.3	244	7.94	1.453	37.4	2.970	0.544	1.5080	172.8
	8	26.8	204	6.37	1.707	34.8	2.217	0.595		
	9	25.0	203	7.61	1.903	42.0	3.196	0 799		
	10	35.3	48.7	5.15	1.818	51.5	2.652	0.936		
	11	53.9	21.8	4.97	2.679	53.5	2.659	1.433		

As shown in table 2, the content of unsaponifiable matter in liver oil decreases when the vitamin A content of liver oil decreases. And the proportion of sterols in the unsaponifiable matter shows an inverse relationship with the amount of unsaponifiable matter in the oil.

In the cases of *S. iracundus* and *S. flammeus* the vitamin A content of unsaponifiable matter increases when the vitamin A content of the liver oil increases.

On the Fixation of Sericin of Raw Silk. (Part VII).

Dechroming Action of Some Chemicals and Chemical Combinations between Sericin and Basic Chromium Complex Salt of Chrome-fixed Cocoon Silk Fibres.

(pp. 814～822)

By Masami OKU and Sigetosi SAITO.

(From the Chemical Fibre Laboratory, Ueda Imperial College of Sericulture and Silk Industry; Received August 30, 1941.)

We have investigated the dechroming action of some chemicals and discussed the mode of chemical combination between sericin and basic chromium complex salt of the chrome-fixed cocoon silk fibres. Dechroming chemicals used in this experiment were Rochelle salt, oxalic acid, sulphuric acid and hydrochloric acid. Results obtained are summarised as follows:

(1) The following conditions were found to be most adequate for the dechroming action under boiling state:

(i) Rochelle salt: 10% solution, 1 hour boiling.

(ii) Oxalic, sulphuric and hydrochloric acid: each 1.0% solution, 10 minutes boiling.

But the complete dechroming could not be obtained without having bad influences upon the firmness of the fixation degrees.

(2) The following conditions were found to be adequate for the dechroming action without having bad influences upon the fixation degrees under boiling state:

(i) 10% Rochelle salt solution containing 8% formaldehyde, boiling for an hour.

(ii) 1.0% sulphuric acid containing 8% formaldehyde, boiling for 10 minutes.

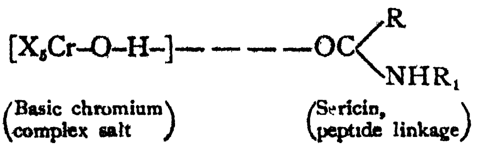
(3) When dechromed under room temperature, oxalic acid was found to be most effective, followed next by sulphuric acid and hydrochloric acid. Rochelle salt was found to be most ineffective, but this chemical was found to be most effective in inviting the reversibility of the soluble property of chrome fixed sericin.

(4) The following solutions were found to be adequate for the dechroming action without losing the firmness of fixation degrees by room temperature.

(i) 5.0% oxalic acid, sulphuric or hydrochloric acid containing 4% formaldehyde, soaking for 10 days longer under room temperature.

(ii) Rochelle salt, in spite of the co-reaction with formaldehyde, showed inferior properties in dechroming, having bad influences upon the firmness of the fixation degrees.

(5) Mode of chemical combination between sericin and basic chromium complex salt by the sample which was tanned under room temperature was discussed from the viewpoint of dechroming results and the following figure was deemed as most probable.



$$[X_5Cr{-}O{-}H{-}]{-}{-}{-}{-}{-}{-}OC\langle^{R}_{NHR_1}$$

Synthese des Oxyathlphthalimid.

(SS. 823～824)

Von Y. OBATA.

(Biochemiches Institut der Landwirtschaftlichen Fakultät, Universität Tokio; Eingegangen am 20. 8. 1941.)

Untersuchungen über das sogenannte „Glucono-bacter“. II. Mitteilung.

(SS. 825～832)

Von Teijirô UYEMURA und Keiji KONDÔ.

(Wissenschaftl. Laboratorium von Ch. Takeda & Co. Ltd., Osaka; Eingegangen am 28. 4. 1941.)

Functional Studies on Soil. (XXXVIII～XXXX).

(pp. 833～838)

By Hideo MISU.

(Agricultural Experiment Station, Government General of Tyosen; Received May 5, 1941.)

Studies on "Tosetu," a Soy-bean Preparation. II.

On the Vitamin B Content of Tosetu.

(pp. 839～847)

By B. KITAHARA, K. KATAI, and M. HANADA.

(Department of Agriculture, Kyûshû Imp. University and Nippon Yusi Kabusiki Kaisya; Received August 11, 1941.)

Studies on the Nutritive Value of Weeds. (3).

(pp. 848～852)

By G. FUKAI and M. SATAKE.

(Military Veterinary College; Received August 12, 1941.)

On the Biochemical Properties of Tomato and Potato Viruses.

(pp. 858~855)

By Tetutaro TADOKORO, Tuneyuki SAITO, and Naomoto TAKASUGI.

(Hokkaido Imperial University; Received August 11, 1941.)

On the Absorption Spectrum of Fatty Oils in Ultraviolet Region.

(pp. 856~862)

By KOZO KAWAKAMI and Hideo MIYAYOSHI.

(The Institute of Scientific Reseach, Manchoukuo; Received July 31, 1941.)

The absorption spectrums of 18 kinds of vegetable oils were observed and it was found that all of them showed the same spectrum in ultraviolet region. By more minute observations, a slight variation of the maximum absorption points were seldom recognized, and the variation was so slight that it was often overlooked. These absorption-maximums were as follows: 3130, 3000, 2820, 2700, 2600, and 2510 Å. The observation of the absorption at 2300 Å which is found in literature, was not undertaken in this experiment. Those points of absorption-maximums were all coincident with those of eleostearic acid and a new fatty acid prepared by Moore from linseed oil by the alkali treatment.

Edisbly and Bradley have supposed that the origin of the absorptions at 3000 and 3130 Å differs from those of the others. The present authors also maintain the same supposition, because the ratio of the extinction coefficient of 3130 Å to that of 3000 Å was almost constant, and the same fact was also observed among the other four absorptions. However, no definite ratio but enormous variations were found between the extinction coefficients of the two absorption groups.

In order to investigate the origin of the absorptions, linseed oil was treated with maleic acid anhydride and a oil free from conjugated double bonds was obtained. A distinct absorption spectrum, special for fatty oils, was observed with the original linseed oil, but it was very weak with the treated oil. It was also proved that no hydroxy compounds took part in the absorptions. For these reasons it is emphasised that the absorptions are due to the conjugated double bonds which may be found in fatty acids.

As to the cause of the absorptions from 2800 to 2500 Å, Bradley has supposed that it may be due to a conjugated trien. However, it was found that the dehydrated product of richinoleic acid which may have no conjugated trien but perhaps a conjugated dien, shows distinct absorption at the definite points. Consequently further investigation must be carried out in this respect.

A co-relation between the extinction coefficients of those absorption-maximums and the drying character of fatty oils was recognized, but there were some exceptions. Therefore the extinction coefficient may not indicate perfectly the degree of the drying character of fatty oils, but that may be an important indicator.

Chemical Researches on the Dyeing of "Oshima-Tsumugi." Part I.

On the Dyeing Tannins from *Rhaphiolepsis umbellata.*

(pp. 863~869)

By Kotaro NISHIDA.

(Laboratory of Agricultural Chemistry, Kagoshima Agricultural College;
Received September 3, 1941.)

Chemical Studies on Shark-Meat. (I).

On the Chemical Composition of Shark-Meat.

(pp. 870~874)

By Kinsuke KONDO, Sakae SHINANO, and Kenkichi YAMAMOTO.

(Nutritional Chemical Laboratory, Department of Agriculture, Kyoto Imperial University;
Received August 28, 1941.)

On the Denaturation of Proteins in Benzine-Extracted Soy-bean During Storage. (I).

(pp. 875~882)

By Shigeki MORI.

(Kondo Laboratory, Institute for Chemistry, Kyoto Imperial University;
Received September 11, 1941.)

Enzymatic Studies on Cereals. (Part XIV).

On the Mechanism of the Decomposition of Starch by the Action of the Amylase of Rice.

(pp. 883~893)

By Gohei YAMAGISI.

(Morioka Imperial College of Agriculture and Forestry;
Received August 11, 1941.)

Up to this time a number of experiments have been performed about the mechanism of the starch-decomposition by the amylase action. And yet no uniformity of opinions was reached in this respect.

The author has investigated this problem using the rice amylase.

The findings may be summarized as follows:

1) The velocities of saccharification of starch by the action of the dextrinifying and the saccharifying amylases were very great at the first two or three hours and then decreased gradually. But even after the lapse of 10 days the saccharifying velocities did not reach zero. After 10 days the degree of saccharification by the dextrinifying and the saccharifying amylases were about 55 per cent and 80 per cent of the theoretical value respectively.

2) In the case of the saccharifying amylase it took two days to make the blue colour disappear with iodine while in the case of the dextrinifying enzyme it disappeared within one hour.

3) In the saccharifying enzyme the disappearance of the colour of starch by iodine occurred just when the degree of decomposition of starch reached 48 per cent, while in the dextrinifying one, it was perfectly colourless when only 17 per cent of starch was saccharified.

4) The liquefying amylase liquefied starch very rapidly at the outset, and then slowly as the time elapsed. After the lapse of one or two days the decomposition reached a limiting value and it was almost completely liquefied using a considerable amount of the enzyme. In spite of the liquefaction of starch being almost entirely finished, the degree of saccharification at that time did not attain 9 per cent and no change of the characteristic blue colour of the digestion mixture with iodine was observed.

5) The decomposition of starch by the saccharifying amylase followed the course of a monomolecular reaction up to about 50 per cent of the saccharification. But in the case of the dextrinifying amylase, a constant value was not obtained for the first order equation.

6) When starch was hydrolysed by the action of the dextrinifying amylase, maltose was formed besides dextrin in the initial stage of the reaction, but using the saccharifying amylase, in addition the existence of glucose was observed.

7) It could be confirmed that in the decomposition products of starch by the action of the dextrinifying amylase a reducing substance which had a higher molecular weight than maltose existed.

8) In both saccharifying and dextrinifying amylases in the course of the decomposition of starch there was a period when the maltose contents were maximum. But the final product was likely to be glucose, though it has been left for further investigation to decide whether or not that was caused by means of the maltase which might occur as an impurity.

9) From the experimental results above stated it could be clearly seen that the three starch-splitting enzymes, the liquefying, the dextrinifying and the saccharifying amylases, decomposed starch with their respective mode. This lends support to this author's opinion, namely, the theory of three enzymes of rice amylase.

Biochemical Studies of "Bakanae" Fungus.

Part 11. The Chemical Constitution of Gibberellin. II.

(pp. 894～900)

By T. YABUTA, Y. SUMIKI, K. ASO, T. TAMURA,
H. IGARASI, and K. TAMARI.

(Tokyo Imperial University; Received August 4, 1941.)

ABSTRACTS
from
TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Chemical Studies on Shark-Meat. (II).

On the Solubilities of Shark-Meat-Protein.

(pp. 901～904)

By Kinsuke KONDO and Yoshio YAMAMOTO.

(Nutritional Chemical Laboratory, Department of Agriculture, Kyoto Imperial University; Received August 28, 1941.)

Studies on Insulin from Fishes.

(pp. 905～912)

By Yuzo TOHYAMA, Sogo TETSUMOTO, Saburo FUKUYA, and Shuzo YAMADA.

(Department of Food Control, The Government Institute for Infectious Diseases, Tokyo Imperial University; Received August 28, 1941.)

Insulin, the internal secretion of the pancreas, is formed in the islet tissue of that organ and passes from there into the general circulation. Brunner,(1) 1682, suggested that the pancreas was in some way connected with the metabolism of fat and carbohydrates. Little progress was made, however, until the classic researches of von Mehring and Minkowski(2) who discovered that the complete removal of the pancreas from dogs is followed by symptoms which closely resemble those observed in human diabetes mellitus. In 1846 Stannius(3) described the structures in the abdominal cavity of certain of the Teleostei. These were afterwards shown by Diamare(4) (1899) to be homologues with the islets of Langerhans of the higher vertebrates. Rennie(5) (1903) examined the islets in 25 species of Teleostei, and usually found at least one encapsulated islet, which he called the "Principal Islet," of relatively large size in each species of fishes. Some 90 species of fish were subsequently examined by McCormick(6) (1924) and also Japanese fishes investigated by Ohsawa(7) (1915), Ukai(8) (1926), Suehiro(9) (1941) and others. From these researches, we know that considerable variation was shown to exist among different species with regard to the position, size, and number of the islets.

Banting and Best(10) succeeded in 1922 preparing physiologically active extract of the pancreas and clearly demonstrated the ability of these extracts to inhibit glycosuria and hyperglycemia in depancreatized animals and to alleviate the symptoms of diabetes mellitus in human beings. The insulin content of the islet tissue of the cod, the halibut and other common fish has been investigated by various workers such as Macleod,(11) McCormick,(12) Vincent, Dodds and Dickens(13) and others. We also gathered the principal islets of tunny, bonito, cod, yellowfish, mackerel and other fishes and extracted with picric acid and the insulin picrate was then extracted from the mass by moist acetone and converted to hydrochloride, mainly following Dudley's method(14) (1924) which applied to the extraction of insulin from the islets of the cod, and also another method we used was the extraction of the fish islets with acid alcohol, namely, the minced fish islets is extracted with 75% ethyl alcohol containing 1.5% of concentrated hydrochloric acid at 35°C and after adjusting pH, precipitated by acetone, washing with acetone and ether, obtained white powder after drying in vacuo.

On standardization of insulin, the physiological method which proved more applicable for the determination of the activity of insulin than chemical method, we applied in our case the cross-over method of Marks :(15) taking six rabbits of approximately 2 kilograms, starved for 24 hours previous to the experiment, and divided into 2 groups and injected subcutaneously with a suitable dose of the standard preparation of insulin into one half of a series of rabbits, and the other half receiving simultaneously a dose of the sample of unknown unitage. 4 to 7 days later the groups are crossed over and are used for the injection of the same preparations. Blood samples are usually taken at one and one-half, at three, and at five hour intervals after the injection or at every hour within the course of five hours. We employed Hagedorn and Jensen's(16) method for the determination of blood sugar. Thus we continued the experiment of the cross over method till the ratio of the blood sugar lowered between two series within 5%, and calculated the potency of our preparation. If we bring together the above experiments, they would be as shown in the following table :—

Name of Fish	Number of fish used	Yield of Langerhans islet (g)	Yield of Insulin (g)	Percentage of yield (%)	International unit (IE)	International unit per g of L. islet (IE)	International unit per fish (IE)
Germo-germo (1)	809	80.00	0.5600	0.700	10.00	70.00	6.9
Germo-germo (2)	173	17.00	0.3400	2.000	ca. 8.00	160.00	15.7
Genno-germo (3) (Frozen)	610	60.00	0.6246	1.041	17.0	193 60	19.0
Neothunnus macropterus	97	13.00	0 2462	1.893	ca. 9 10	172.34	22.9
Parathunnus sibi	114	15.0	0.2040	1.361	ca. 10.00	136.10	17.9
Katsuwonus vagans (1)	665	60.00	0.3881	0.646	20.00	129.36	11.6
Katsuwonus vagans (2)	115	10.00	0.0545	0.545	ca. 20.00	109.00	9.4
Gadus macrocephalus	310	25.00	0.2889	1.155	13.30	153.69	12.3
Sebastodes flammens	1070	72.00	0.9328	1.294	15.00	194.33	13.0
Seriola quinqueradiata	106	13.70	0.2172	1.585	ca. 8.0	126.80	16.4
Scomber japonicus	1370	20 60	0.1543	0.749	ca. 13 00	97.30	1.5

LITERATURE.

(1) J. C. von Brunner: Experimenta nova circa pancreas, (1682).

(2) J. von Mehring and O. Minkowski: Arch. f. exper. path. u. pharmakol., **26**, 317, (1890).

(3) F. H. Stannius: Anatomie der Wirbeltiere. Berlin, (1846).

(4) V. Diamare: Internat. Monat. f. Anat. u. Physiol., **16**, 155, (1899).

(5) J. Rennie: J. Anat. and Physiol., **37**, 385, (1905).

(6) N. A. McCormick: Trans. Roy, Canad. Inst., **15**, 57, (1924).

(7) G. Ohsawa: Nisshin-Igaku, **5**, 279, (1915).

(8) T. Ukai: Tohoku-Igaku-Zasshi, **9**, 37, (1926).

(9) Y. Suehiro: J. Imper. Fish. Experim. Stat., **11**, 121, (1941).

(10) F. G. Banting and C. H. Best: J. Lab. and Clin. Med., **7**, 464, (1922).

(11) J. J. R. Macleod: J. Metabolic Research, **2**, 149, (1922).

(12) N. A. McCormick: Bull. Biol. Board Canad., Dec. (1924).

(13) S. Vincent, E. C. Dodds, and F. Dickens: Lancet, **2**, 115, (1924).

(14) H. W. Dudley: Biochem. J., **18**, 665, (1924).

(15) H. P. Marks: Brit, Med. J., **2**, 102, (1925).

(16) H. C. Hagedorn u. B. N. Jensen: Biochem. Ztschr., **135**, 46, (1923).

On the Steppe Soil Type in North-Eastern Region of Manchuria.

(pp. 913～918)

By R. KAWASHIMA.

(Agr. Chem. Laboratory, Kyushu Imp. University; Received September 30, 1941.)

Untersuchungen über das sogenannte „Gluconobacter.“ III. Mitteilung.

(SS. 919～927)

Von Teijirô UYEMURA und Keiji KONDO.

(　　　　　　　　)

The Chemical Components of Cotton-hulls Produced in Manchuria and North-China.

(pp. 928～930)

By Rishichi TANAKA.

(The Central Laboratory, South Manchuria Railway Co, Dairen, Japan;
Received September 24, 1941.)

Studies on the Relationship between Horsehair's Lustre and Nutrition. (I).

(pp. 931∼936)

By S. Miyamoto, N. Onuma, K. Arai, and G. Fukai.

(Military Veterinary College; Received August 12, 1941.)

Über die Awamori-Bereitung nach dem modifizierten Amyloverfahren.

(SS. 937∼943)

Von S. Simo und N. Kanayama.

(The Institute of Research on Chemical Industry, Governmen -General of Taiwan, Japan; Received September 22, 1941.)

On the Denaturation of Proteins in Benzine-Extracted Soy-bean During Storage. (II).

(pp. 944∼946)

By Shigeki Mori.

(Kondo Laboratory, Institute for Chemistry, Kyoto Imperial University; Received September 11, 1941.)

Functional Studies on Soil. (XXXXI∼XXXXIII).

(pp. 947∼958)

By Hideo Misu.

(Agricultural Experiment Station, Government General of Tyosen; Received May 4, 1941.)

Studies on the Production of Acetone and Buthanol by Fermentation. Part II.

On the Production of Acetone and Buthanol from Jerusaleum Artichoke.

(pp. 959∼974)

By Toshinobu Asai, Riukichi Kojima, and Isamu Watanabe.

(Agricultural Chemical Laboratory, Tokyo Imp. Univ; Received September 16, 1941.)

Inulin and fructan contained in Jerusalem artichoke can not be utilized for acetone-buthanol fermentation because of the incomplete decomposition to fructose molecule. Only the mash prepared from the completely saccharified tubers shows the normal fermentation.

It was found that the following conditions were suitable for fermentation.

Saccharifying conditions:—The weight of adding water to the fresh tuber was about twice the volume of it. HCl was added to 0.15% concentration to the cooking mass, the cooking pressure was about 30 lbs and the cooking duration was between 50~60 minutes. Saccharifying ratio reached to over 90% calculated as fructose.

Fermentation conditions:—Optimum H=ion concentration for the fermentation was between pH 4.8~5.2, and optimum concentration of the mash existed between 6~7% of the fructose concentration from the standpoint of industrial purpose. Addition of the nutrients were not necessary.

Under the above conditions, ca. 9.00% of acetone and ca 17.00% of buthanol, calculated each to the original inulin value of the tubers, were produced after 43 hrs. fermentation. The temperature of incubation was 35°C. The acetone-buthanol bacillus used was Clostridium Nr. 314 isolated and cultivated in this laboratory, which showed the most excellent yield of the two solvents from Jerusalem artichoke.

The semi-plant scale fermentation was also conducted.

Biochemical Studies of "Bakanae" Fungus. Part XII.

The Chemical Constitution of Gibberellin. III.

(pp. 975~984)

By T. YABUTA, Y. SUMIKI, K. ASO, T. TAMURA, H. IGARASI, and K. TAMARI.

(Tokyo Imperial University; Received August 4, 1941.)

Study of the Insecticidal Principle in the Smoke Produced by Combusting Insect Powder. (Part V).

(pp. 985~991)

By Makoto NAGASE.

(Agricultural Chemical Department, Taihoku Imperial University, Taiwan; Received September 21, 1941.)

Über die Bildung der Oxalsäure aus Methanol oder Ameisensäure durch Asp. niger. var Nr. 2. (Citronensäurebildner).

(SS. 992~994)

Von S. BABA.

(Aus dem Agrikulturchem. Laboratorium der Kaiserl, Tokio Universität; Eingegangen am 29. Sept. 1941.)

Durch die Sporenkultur der Asp. niger. var. Nr. 2. (citronensäurebildner) konnte der Verfasser die Bildung der Oxalsuäre aus Methanol, welches die einzige Kohlenquelle ist, erst bestatigen.

Die Ausbeute der Oxalsäure beträgt 10% des Verbrauchsmethanols.

In Substituierung der Ameisensäure (als Amm-salz) für das Methanol konnte der Verfasser ebenso wie K. Bernhauer u. F. Slanina die Bildung der Oxalsäure, deren Ausbeute 35% der Verbrauchs ameisensäure ausmacht, bestatigen.

Die Zusammensetzung des Nährbodens ist wie folgt:

Methanol oder Ameisensäure	1%	K_2HPO_4	0.05%
$(NH_4)_2HPO_4$	0.55%	$MgSO_4 \cdot 7H_2O$	0.05%
KH_2PO_4	0.05%	PH	schwach sauer.

Die Kulturdauer ist 20 Tage.

Für die freundliche Hilfe bei dieser Untersuchung spricht der Verf seinen verbindlichsten Dank Prof. Dr. K. Sakaguchi, a. o. Prof. Dr. T. Asai und den Herren des Seminars aus.

Biochemical Studies on the Tissues and Organs of the Silk Worm, *Bombyx mori* L.

Part I. On the Catalase Actions of the Fatty Bodies.

(pp. 995~1000)

By Takeo NAKASONE.

(Mie Prefectural Sericultural Experiment Station; Received September 22, 1941.)

The author investigated some properties of the catalase in the fatty bodies of Bombyx mori and also the changes in the activities of the catalase according to the growth of the silk worm after the 4th instar.

The results may be summarized as follows:

1. The fatty bodies of the full grown larva of Bombyx mori show the reaction of about pH 6.70 but it differs more or less according to the stages of the development of the fatty bodies.
2. The optimum conditions for the activity of the catalase of the fatty bodies are about pH 6.8 in reaction and about 24~25°C in temperature.
3. There are racial and sexual differences in the activities of the catalase both in fatty bodies and body fluid; the activity is higher in No. 111 Japanese race than in No. 19 European and in the males than in the females.
4. Activities of the catalase in the fatty bodies according to the growth of the silk worm seems not to be influenced by the activities of the catalase in the body fluid.
5. The catalase action of fatty bodies and body fluid of the unhealthy silk worm is weaker than that of the healthy one.
6. The activities of the catalase of the fatty bodies of the silk worm are stronger at the stages of ecdysis or of metamorphosis than at other stages of growth.

Vol. 17 December 1941 No. 12

Bulletin of the Agricultural Chemical Society of Japan.

ABSTRACTS
from
TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Biochemical Studies of "Bakanae" Fungus.

Part 13. Action of Gibberellin on Tobacco Seedlings.

(pp. 1001∼1004)

By T. Yabuta, Y. Sumiki, K. Aso, and T. Hayasi.
(Tokyô Imperial University; Received September 15, 1941.)

Studies on the Fat of *Phaseolus radiatus* L. var. *aurea* Prain. (I).

Fatty Acids and Sterols.

(pp. 1005∼1008)

By Nobuo Ito.
(Agr. Chem. Laboratory, Hokkaido Imperial University;
Received October 2, 1941.)

The fat of Azuki-bean (*Phaseolus radiatus* L. var. *aurea* Prain), from which the acetone-insoluble matters (23.6%) were excluded, has been studied by the author.

Some constants of the fat are as follows:—

d_4^{15}	0.9618
N_D^{20}	1.4670
Saponification value	176.56
Acid value	29.74
Iodine value	58.45

The neutralisation value of the unvolatile fatty acids is 197.07 and the iodine value 122.17.

In the unvolatile acids, the solid fatty acids amount to 25% and they consist of stearic acid 50%, palmitic acid 30% and carnaubic acid(?) 20%. The liquid fatty acids have been examined with the bromination and the hydrogenation methods, and ascertained to consist of $C_{18}H_{34}O_2$, $C_{18}H_{32}O_2$, and a little linolenic acid.

Unsaponifiable matters are crystalline and amount to 10.81% of the fat. Stigmasterol has been isolated and a more soluble phytosterol melting at 153°, with $[\alpha]_D^{16} = -40.85°$, has also been obtained from the matters.

A Method for Determining Milk Solids in Modified Milk Powders.

(pp. 1009～1018)

By Tomokiti SAKAI.

(Research Laboratory of Meiji Sugar Co.; Received October 4, 1941)

Untersuchungen über das sogenannte „Gluconobacter."

IV. Mitteilung.

(SS. 1019～1028)

Von Teijirô UYEMURA und Keiji KONDO.

(Wissenchftl. Laboratorium von Ch. Takeda and Co Ltd, Osaka;
Eingegangem am 28. 4. 1941)

Investigation of Glutamic Acid Preparation. (Part V).

Experiment on a Semi-Industrial Scale.

(pp. 1029～1036)

By Bunzo ROKUSHO, Rishichi TANAKA, and Hiroshi SAITO.

(The Central Laboratory, South Manchuria Railway Co., Dairen;
Received October 11, 1941.)

We studied the preparation of glutamic acid from various oil cakes produced in Manchuria, on a semi-industrial scale. 20 kgs. of oil cake were hydrolysed with 60 kgs. hydrochloric acid solution in an autoclave at 20 lbs/sq. in. in each case. The glutamic acid was isolated from its hydrochloride obtained from hydrolysate. The results were as follows.

Raw materials	Conc. of HCl %	The yield of glutamic acid %	
		Based on raw material	Based on protein
Soybean flake (extracted with EtOH)	22	5.15	10.84
Cotton seed press cake	24	4.08	10.07
Soybean flake (extracted with benzine)	22	4.61	9.84
Perilla press cake	22	4.17	12.84
Castor press cake	22	2.64	9 86
Peanut press cake	22	1.20	3.22

Digestibility of Acorns Fed to Sheep and Rabbits.

(pp. 1037～1047)

By Hisayoshi IWATA and Bunei HIROUCHI.

(Morioka Imperial College of Agriculture and Forestry;
Received September 1, 1941.)

About 80% of organic matter of the shelled and crushed acorns, and about 86% of their nitrogen free extract were digested by sheep and rabbits. The amount of the total digestible matter of the Japanese acorns was about 71%.

Relation of Fat to Riboflavin Requirement of Growing Rats.

(pp. 1048～1052)

By Ume TANGE.

(The Institute of Physical and Chemical Research;
Received October 2, 1941.)

It has been demonstrated that the increased fat level in a riboflavin deficient ration has an injurious effect on the normal growth of rats, and that the administration of adequate amounts of riboflavin improves this condition.

The detailed accounts of this subject are now in press in the Scientific Papers of the I. P. C. R.

Functional Studies on Soil. (44~46).

(pp. 1053~1061)

By Hideo MISU.

(Agricultural Experiment Station, Government General of Tyosen;
Received August 4, 1941.)

On the Chemical Studies of the Baggasse Pulp. (7).

(pp. 1064~1066)

By T. TADOKORO and M. NISHIDA.

(Hokkaido Imperial University; Received August 30, 1941.)

Über die Verwandlungen der chemischen Zusammensetzungen der Getreidefenniche im Wachstum.

(SS. 1067~1076)

Von Tetujiro OBARA.

(Aus der landwirtschaftlichen Fachschule für Erziehung, Tokio, Nippon;
Eingegangen am 15. Okt. 1941.)

Study of the Insecticidal Principle in the Smoke Produced by Combusting Insect Powder. (Part VI)

(pp. 1077~1081)

By Makoto NAGASE.

(Agricultural Chemical Department, Taihoku Imperial University, Taiwan;
Received September 21, 1941.)

Biochemical Studies on the Tissues and Organs of the Silk Worm, *Bombyx mori* L.

Part II. On the Catalase Actions of the Malpighian Vessels.

(pp. 1082~1084)

By Takeo NAKASONE.

(Mie Prefectural Sericultural Experiment Station; Received September 22, 1941.)

The author studied the catalase actions of the Malpighian vessels of Bombyx mori during the larval growth and also some properties of the catalase in the Malpighian vessels of the full grown larva.

The results may be summarized as follows:—

1. The optimum conditions for the catalase activity in the Malpighian vessels are about pH 6.60 in reaction and about 20°C in temperature but the activity of the catalase gradually becomes weaker after twenty minutes even under those conditions.

2. The catalase of the Malpighian vessels of Bombyx mori reacts with a cycle in each stage of instar and pupa.

3. The activity of the catalase becomes weaker after ecdysis but it is stronger before ecdysis.

Studies on Ascorbic Acid. IV.

On the Action of Ascorbic Acid on Glutathione. II.

(pp. 1085~1094)

By Kichinosuke FUJIMURA.

(Laboratory of Nutritional Chemistry, Dept. of Agricultural and
Chemical Institute, Kyoto Imperial University;
Received October 14, 1941.)

Chemical Studies on Shark Meat (III).

Isolation of Shark Meat Protein.

(pp. 1095~1101)

By Kinsuke KONDO, Tadao HATA, and Seiichi KIMURA.

(Nutritional Chemical Laboratory, Department of Agriculture, Kyoto Imperial University;
Received August 28, 1941.)

Über die Bestandteile der Japanischen Mistel.

IV. Mitteilung. Harz- und Fettsäure im Wachs.

(SS. 1102~1106)

Von Yataro OBATA.

(Biochemiches Institut der Landwirtschaftlichen Fakultät, Universität Tokio;
Eingegangen am 23. Okt. 1941.)

Über die quantitative Bestimmung der Pyrethrine.

X. Mitteilung. Über den Pyrethringehalt und den Wirkungsgrad von Moskitostäbchen.

(SS. 1107~1110)

Von Sankiti Takei, Kiyosi Wakazono und Keizo Hiraoka.

(Aus d. Institut f. Chem. Forschung, Universität Kyoto;
Eingegangen am 16. Okt. 1941.)
